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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 9

IN THE MATTER OF:

Anaconda /Yerington Mine Site
Yerington, Lyon County,
Nevada

Atlantic Richfield Company,

Respondent

ADMINISTRATIVE ORDER FOR
REMEDIAL INVESTIGATION AND
FEASIBILITY STUDY

U.S. EPA Region
CERCLA
Docket No. 9-2007-0005

Proceeding Under Section 106(a) of the
Comprehensive Environmental Response,
Compensation, and Liability Act, as
amended, 42 U.S.C. § 9606(a)

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ATTACHMENTS

Attachment 1 Statement of Work

Attachment 2 Map showing location of the Site

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I. INTRODUCTION AND JURISDICTION

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1. This Order directs Atlantic Richfield Company, ("Respondent") to conduct a Remedial Investigation ("RI") and Feasibility Study ("FS") for hazardous substances, pollutants and contaminants in and adjacent to the former copper mine located at 103 Birch Drive near Yerington, in Lyon County, Nevada, including portions of Township 13N, Range 25E, Sections 4, 5, 8, 9, 16, 17, 20, and 21 (Mount Diablo Baseline and Meridian) on the Mason Valley and Yerington United States Geologic Survey 7.5 minute quadrangles (the "Anacaonda /Yerington Mine Site" or the "Site"). Pursuant to this Order, Respondent will conduct the Work described herein to investigate an imminent and substantial endangerment to human health or the environment that may be presented by the actual or threatened release of hazardous substances, pollutants, contaminants or solid wastes at or from the Site, and to provide an FS for potential response actions.

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2. This Order is issued to Respondent by the United States Environmental Protection Agency, Region 9 ("EPA") pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA"), 42 U.S.C. § 9606(a), and delegated to the EPA Administrator by Executive Order No. 12580, January 23, 1987, 52 *Fed. Reg.* 2923, as amended by Executive Order No. 13016, August 30, 1996, 61 *Fed. Reg.* 45,871, further delegated to the EPA Regional Administrators by EPA Delegation No. 14-B and further delegated to the Superfund Branch Chief by Regional Delegation 1290.14A, dated November 16, 2001.

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3. In issuing this Order, EPA's objectives are to: (a) determine the nature and extent of contamination and threats to human health or the environment caused by certain releases or threatened releases of hazardous substances, pollutants, contaminants or solid wastes at or from the Site; and (b) to identify and evaluate remedial alternatives to prevent, mitigate or otherwise respond to or remedy certain releases or threatened releases of hazardous substances, pollutants, or contaminants at or from the Site, by conducting an FS in accordance with the National Contingency Plan, 40 C.F.R. Part 300 ("NCP").

4. The activities conducted under this Order are subject to approval by EPA, and Respondent shall provide all information for the RI and FS in a manner that is consistent with CERCLA and the NCP, 40 C.F.R. Part 300. The activities under this Order shall be conducted in compliance with the attached Statement of Work ("SOW"), attached hereto as Attachment I, and all applicable EPA guidance, policies, and procedures.

II. FINDINGS OF FACT

5. a. The Site is an abandoned, low-grade copper mine and extraction facility located in the Mason Valley, in Lyon County, Nevada. The Site is located approximately one mile west of Yerington, directly off of Highway 95. The Site occupies 3,468.50 acres of disturbed land in a rural area, bordered to the north by open fields of alfalfa and residential acreage, and to the east by Highway 95, which separates the Site from the city of Yerington, Nevada. Approximately fifty percent of the Site is privately owned land, and the rest is land within the jurisdiction, custody and control of the United States Bureau of Land Management ("BLM"). To the south continues BLM range land, and to the west and southwest the Singatse mountains.

6. Facilities associated with mining operations at the Site include an open-pit mine, mill buildings, tailing piles, waste fluid ponds, and the adjacent residential settlement known as Weed Heights. A network of leach vats, heap leaching pads and evaporation ponds remains throughout the Site, in addition to a lead working shop, a welding shop, a maintenance shop, two warehouses, an electro-winning plant, and an office building.

7. The Site began operation in or about 1918, originally known as the Empire Nevada Mine. In 1953, Anaconda Copper Mining Company ("Anaconda") acquired and began operating the Site. In or about 1977, Respondent acquired Anaconda and assumed its operations at the Site. In June 1978, Respondent terminated operations at the Site. In or about 1982, Respondent sold its interests in the private lands within the Site to Don Tibbals, a local resident, who subsequently sold his interests with the exception of the Weed Heights community to Arimetco, Inc. ("Arimetco"), the current owner. Arimetco operated a copper recovery operation from existing ore heaps within the Site from 1989 to November 1999. Arimetco has terminated operations at

1 the Site and is currently managed under the protection of the United States Bankruptcy Court in
2 Tucson, Arizona.

3 8. During the 25-year operational period that Anaconda and Respondent operated the Site,
4 they removed approximately 360 million tons of ore and debris from the open pit mine, much of
5 which now remains in tailings or leach heap piles. Anaconda and Respondent beneficiated copper
6 ores from the mine by two separate methods depending on the ore type. The mined ore contained
7 copper oxides in the upper portion of the open pit and copper sulfides in a lower portion of the
8 open pit. During on-Site milling operations, a copper precipitate was produced from the oxide ore
9 and a copper concentrate was produced from the sulfide ore. In the first of two processing
10 methods for the oxide ore, the operator placed the copper oxide ore in leaching vats and leached
11 out copper with sulfuric acid. The copper precipitated out after passing over iron scraps. The
12 second process, which started in 1965, used dilute sulfuric acid spread over the top of low grade
13 oxide ore piles from which copper would leach out with the resulting acidic solution, with the
14 copper again precipitated out after passing over iron scraps. Anaconda and Respondent utilized
15 this dump leaching method for over 10 years at the W-3 dump at the Site. To facilitate their
16 leaching operations, Anaconda and Respondent produced their own sulfuric acid at the Site at a
17 rate of over 400 tons per day. To process the copper sulfide ore, Anaconda and Respondent
18 crushed the ore and produced copper concentrate by flotation, with lime (calcium oxide) added to
19 maintain an alkaline pH. The resulting copper concentrate would be shipped off-Site for final
20 processing.

21 9. Byproducts of the milling operation were wet gangue from the sulfide ore and wet tailings
22 and iron- and sulfate-rich acid brine from the oxide ore. Respondent left gangue and tailings at
23 the Site in large dumps and ponds. Respondent evaporated the acid brine in large evaporation
24 ponds, some of which ponds were equipped with asphalt liners, while others were unlined. Aerial
25 photographs taken in August 1977 indicated that the disposal ponds occupied approximately
26 1,377 acres. The evaporation pond and the tailings piles may have leached contaminants into the
27 groundwater.

10. Arimetco used solvent extraction and electro-winning to extract copper from copper oxide ore, including the reprocessing of some ore first processed by Anaconda or Respondent. The process used by Arimetco involved leaching the ore successively with a mild acid solution and kerosene in three process vats with a total storage of 200,000 gallons. A stronger sulfuric acid solution subsequently removed copper from the kerosene solution. A final electro-winning plant plated the copper onto stainless steel sheets. Arimetco recirculated the acid solution from the electro-winning vats back to the leach heaps. The leach heap pads currently drain acidic fluids. Records indicate that on February 3, 1997, there was a 40,000 gallon spill of sulfuric acid from Arimetco's facilities.

11. Atlantic Richfield maintained assorted tanks throughout the Site for acetylene gas, nitrogen gas, oxygen gas, liquid nitrogen, unleaded gasoline, and diesel fuel. These materials were used on-Site for vehicle maintenance and refueling.

12. In 1999, at the request of the Yerington Paiute Tribe, EPA began an evaluation of the Site to determine the effectiveness of the existing pump-back system in preventing off-Site migration of contaminated groundwater and to determine whether any domestic wells had been impacted by the Site. EPA collected groundwater samples from on-Site monitoring wells, from the Wabuska Drain, and from nearby residential and community wells, including the wells of the Yerington Paiute Tribe. In November 1999, the Nevada Division of Environmental Protection ("NDEP") collected additional samples to provide data to support model scoring under the Hazard Ranking System for groundwater and surface water migration pathways. Analyses of samples from the monitoring wells indicated concentrations of arsenic at 50 to 100 parts per billion ("ppb"), cadmium at 8 to 20 ppb, iron up to 1,400,000 ppb, mercury at 0.4 to 0.7 ppb, and nickel at 100 to 1200 ppb. In addition, samples from a shallow groundwater monitoring well located less than a quarter mile from the Site contained concentrations of arsenic at 60 ppb, copper at 30 ppb, and iron at 4,300 ppb. Drinking water maximum contaminant levels, for comparison, are as follows: arsenic at 10 ppb; cadmium at 5 ppb; iron at 600 ppb; mercury at 2 ppb; and nickel at 100 ppb.

13. Analyses of samples from domestic and agricultural water wells indicated that concentrations of salinity and, in some instances, iron were high. Arsenic concentrations in most

1 production wells were below or at the detection limit of 20 ppb, except at four residential wells
2 near the northwest corner of the Site on Luzier and Locust Lanes, which exhibited arsenic
3 concentrations from 40 to 60 ppb.

4 14. Results of surface water analyses indicated elevated concentrations of arsenic, iron, lead,
5 manganese and sulfate immediately downgradient of the Site in the Wabuska Drain. These
6 concentrations diminished with distance from the Site along the length of the drain.

7 15. EPA confirmed that over 3,000 acres of tailings with a potentially high concentration of
8 metals remained at the Site, and that the abandoned process fluids emanating from the tailings
9 have a low pH and contain excessive quantities of arsenic, cadmium, chromium, copper, and iron.
10 Salts precipitating from these seeps contain even higher concentrations of such metals. Also
11 present are radionuclides, including uranium, thorium, and radium.

12 16. In October 2000, EPA conducted an Expanded Site Inspection at the Site, which consisted
13 of collecting groundwater samples from six monitoring wells on and around the Site, and samples
14 of standing water from a below ground cellar, pregnant leachate solution, tailings and leachate
15 salts. These samples again confirmed high concentrations of contaminants, including beryllium,
16 cadmium, chromium, lead, mercury, and selenium. The groundwater monitoring well samples
17 revealed levels above the regulatory limits for drinking water of arsenic, beryllium, cadmium,
18 chromium, lead, and selenium. EPA concluded from this study that toxic heavy metals exist in
19 source materials at the Site and have contaminated groundwater. The local groundwater is a
20 source of drinking water for an approximate 5,020 people living within four miles of the Site.

21 17. In November 2001, EPA obtained and analyzed surface and subsurface soil samples from
22 within the Site and from off-Site areas that might have been affected by the Site (specifically the
23 Yerington Paiute Colony). Off-Site sampling in these potentially affected areas revealed arsenic
24 levels above EPA's Preliminary Remediation Goals ("PRGs"). In this November 2001 study,
25 EPA also assessed Site security and identified security concerns regarding the lack of maintained
26 fencing and unauthorized access with dirt bikes and four-wheel-drive off-road vehicles.

18. In December 2003, EPA conducted a screening level gamma ray survey of the surface sediments in evaporation ponds and detected radiation levels in excess of three times background.

19. Since September 2002, Respondent has been conducting response activities at the Site pursuant to a consent agreement with NDEP. As part of this work, since December 2003, Respondent has been sampling domestic wells north of the mine Site and has found that fifty seven wells have gross alpha radiation levels of up to seven times the regulatory limit (78.4 pico-Curies per liter) and thirty-four of those wells have uranium levels of up to four times the regulatory limit (101 micrograms per liter). Respondent has voluntarily provided bottled water to residents whose wells exceed the regulatory limits, and is currently providing bottled water to sixty households north of the mine. On the Yerington Paiute Reservation, where one of the tribal supply wells exceeded the regulatory limit for uranium and gross alpha radiation, Respondent is providing bottled water to another eighty households.

20. From June through December 2004, BLM conducted a surface radiological survey of the process areas of the Site and certain other portions of the Site, and soil sampling from areas of elevated radiation. The samples indicated substantially elevated levels of radium 226 at 9,300 pico-Curies per gram ("pCi/gm"), which is above EPA's PRG of 3.7 pCi/gm for an industrial worker and radium 228 at 78 pCi/gm, which is above EPA's PRG of 8.4 pCi/gm for an industrial worker. This survey identified areas with elevated levels exceeding PRGs for uranium and thorium radioisotopes and exposure rates as high as 5 milliREM per hour (more than two times EPA's guidance level for unrestricted property). The identified occurrence of the radiological contaminants at greater than background levels indicates that process solutions, copper ore, and potentially waste rock throughout the Site could contain disturbed or "technologically enhanced" naturally occurring radioactive materials, which may have migrated from the Site through saturated sediment, sludges, crushed and uncrushed rock, fugitive dust and precipitated solutions and be impacting surface water and groundwater.

21. Early in April 2006, the United States Fish and Wildlife Service reported observing a dead bird nearby some standing fluid on the sulfide tailings during the course of a natural resource damage assessment. In considering whether the bird mortality resulted from the ingestion of the

fluid, which appears to be the result of precipitation that had dissolved existing residues from past mining activities, EPA obtained and analyzed fluid samples from five areas of standing fluids on the north end of the Site. The sampling addressed: the three pumpback containment ponds; areas of standing water within the asphalt-lined evaporation ponds; and the Arimetco pregnant solution collection ditch adjacent to the Vat Leach Heap Leach Pad. Preliminary analytical results indicate very low pH fluids containing elevated uranium and metals in each of the three areas as follows: (1) the pumpback ponds exhibit low pH ranging from 2.6 to 4.0, with uranium concentrations from 850 to 2,100 ug/l and elevated metals up to 10 times or greater than those seen in the extraction wells supplying the ponds; (2) an area of standing water, exhibited a pH of 0.29, uranium at 27,000 ug/l and elevated metals up to 4 times higher than seen in EPA's October 2000 sampling of similar standing fluid in a below ground cellar; and (3) the Arimetco fluid sampled exhibited a pH of 2.7, uranium at 8,900 ug/l and elevated metals at approximately the same magnitude as seen in EPA's October 2000 sampling of similar pregnant solutions. Fluids with such low pH and elevated metals potentially pose acute toxicity to wildlife. Additionally, the elevated uranium concentrations pose a threat of substantial harm to the public health or welfare or the environment.

22. Carcinogens at the Site include arsenic, chromium, the radioisotopes of uranium (uranium-234, uranium-235, and uranium-238), the radioisotopes of thorium (thorium-230 and thorium-232), and the radioisotopes of radium (radium-228 and radium-226). Aluminum, arsenic, beryllium, boron, cadmium, copper, iron, lead, manganese, mercury, molybdenum, selenium, zinc, uranium, and chloride and sulfate are toxic metal contaminants at the Site. Disturbed and concentrated heavy metals at the Site pose threats through inhalation and ingestion that can result in neurological, kidney, and liver damage, and behavior and learning problems.

23. By agreement with NDEP, EPA has assumed the lead agency role for this Site.

24. The Administrative Record supporting this action is available for review at the EPA Region IX offices located at 75 Hawthorne Street, San Francisco, California (94105).

1 III. CONCLUSIONS OF LAW AND DETERMINATIONS

2 25. The Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

3 26. Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C.
4 § 9601(21).

5 27. The contamination found at the Site, as identified in Section II of this Order (Findings of
6 Fact), includes "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C.
7 § 9601(14).

8 28. Respondent owned or operated the facility during a period of time when hazardous
9 substances were disposed of and is, therefore, a "liable" party as defined in Section 107(a) of
10 CERCLA, 42 U.S.C. § 9607(a), and is subject to this Order under Section 106(a) of CERCLA, 42
11 U.S.C. § 9606(a).

12 29. The conditions at that Site, as described in Section II of this Order (Findings of Fact),
13 constitute an actual or threatened "release," as defined in Section 101(22) of CERCLA, 40 U.S.C.
14 § 9601(22). The potential for future migration of hazardous substances from the Site poses a
15 threat of a continued "release."

16 30. The release or threat of release of one or more hazardous substances from the Site may
17 present an imminent and substantial endangerment to the public health or welfare or the
18 environment under Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

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20 31. The actions required by this Order are necessary to protect the public health, welfare, and
21 the environment and are consistent with the NCP and CERCLA.

1 IV. NOTICE TO THE STATE AND BLM

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3 32. On January 11, 2007, prior to issuance of this Order, EPA notified the NDEP and the
4 BLM that EPA would be issuing this Order.

5 V. ORDER

6 33. Based on the foregoing, Respondent is hereby ordered to comply with the following
7 provisions, including but not limited to, all attachments to this Order, all documents incorporated
8 by reference into this Order, and all schedules and deadlines in this Order and its attachments.

9 VI. DEFINITIONS

10
11 34. Unless otherwise expressly provided herein, terms used in this Order which are defined in
12 CERCLA or in regulations promulgated thereunder shall have the meaning assigned to them in
13 the statute or the implementing regulations. Whenever terms listed below are used in this Order
14 or in the documents attached to this Order or incorporated by reference into this Order, the
15 following definitions shall apply:

16 "BLM" shall mean the United States Department of the Interior, Bureau of Land
17 Management.

18 "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and
19 Liability Act of 1980, as amended, 42 U.S.C. §§ 9601 *et seq.*

20 "Day" shall mean a calendar day unless expressly stated to be a working day. "Working
21 day" shall mean a day other than a Saturday, Sunday, or federal holiday. In computing any period
22 of time under this Order, where the last day would fall on a Saturday, Sunday or federal holiday,
23 the period shall run until the end of the next working day.
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25 "Effective Date" shall mean the Effective Date of this Order as provided in Section XVI.

1 "Engineering Controls" shall mean constructed containment barriers or systems that
2 control one or more of the following: downward migration, infiltration or seepage of surface
3 runoff or rain; or natural leaching or migration of contaminants through the subsurface over time.
4 Examples of "Engineering Controls" include caps, engineered bottom barriers, immobilization
5 processes and vertical barriers.

6 "EPA" shall mean the United States Environmental Protection Agency, Region IX.

7 "Institutional Controls" shall mean non-engineered instruments, such as administrative or
8 legal controls, that help to minimize the potential for human exposure to contamination and/or
9 protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional
10 controls include easements and covenants, zoning restrictions, special building permit
11 requirements, and well drilling prohibitions.

12 "National Contingency Plan" or "NCP" shall mean the National Contingency Plan
13 promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part
14 300, including any amendments thereto.

15 "Operable Unit" shall mean the discrete areas or tasks within the Site as determined by
16 similarities in the location or hazardous substances present, and as further defined in the SOW.

17 "Paragraph" shall mean a portion of this Order identified by an arabic numeral.

18 "Response Costs" shall mean all costs, including direct costs, indirect costs, and accrued
19 interest incurred by the United States to perform or support response actions at the Site. Response
20 costs include but are not limited to the costs of overseeing the Work, such as the costs of
21 reviewing or developing plans, reports and other items pursuant to this Order and costs associated
22 with verifying the Work.

23 "Statement of Work" or "SOW" shall mean the statement of work for implementation of
24 the RI and FS, as set forth in Attachment 1 to this Order.

1 "Section" shall mean a portion of this Order identified by a roman numeral and includes
2 one or more Paragraphs, unless otherwise referenced. References to sections in the SOW will be
3 so identified (i.e., "SOW Section V").

4 "Site" shall mean the Anaconda/Yerington Copper Mine Site, encompassing 3,468 acres,
5 located at 103 Birch Drive, near Yerington, Nevada, in Lyon County, and as generally depicted in
6 Attachment 2.

7 "State" shall mean the state of Nevada.

8 "United States" shall mean the United States of America.

9 "Work" shall mean all activities that Respondent is required to perform under this Order,
10 except those required in Paragraph 71 (Retention of Records).

11 VII. NOTICE OF INTENT TO COMPLY

12 35. Respondent shall provide, not later than February 1, 2007, or ten (10) days after the
13 Effective Date of this Order, whichever is later, a written notice to EPA's Remedial Project
14 Manager ("RPM") stating whether it will comply with the terms of this Order. If Respondent
15 does not unequivocally commit to perform the Work as provided by this Order, it shall be deemed
16 to have violated this Order and to have failed or refused to comply with this Order. Respondent's
17 written notice shall describe, using facts that exist on or prior to the Effective Date of this Order,
18 any "sufficient cause" defenses asserted by Respondent under Sections 106(b) and 107(c)(3) of
19 CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice
20 required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions.

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VIII. PARTIES BOUND

36. This Order shall apply to and shall be binding on Respondent and on its directors, officers, employees, agents, successors, and assigns. No change in the ownership, corporate status, or other control of any of the entities referenced in this Paragraph shall alter any of Respondent's responsibilities under this Order. No change in the ownership, corporate status, or other control of Respondent shall alter any of Respondent's responsibilities under this Order.

37. Respondent shall provide a copy of this Order to any prospective owners or successors before a controlling interest in Respondent's assets, property rights, or stock are transferred to the prospective owner or successor. Respondent shall provide a copy of this Order to each contractor, sub-contractor, laboratory, or consultant retained to perform any Work under this Order, within five (5) days after the Effective Date of this Order or on the date such services are retained, whichever date occurs later. Respondent shall also provide a copy of this Order to each person representing Respondent with respect to the Site or the Work and shall condition all contracts and subcontracts entered into hereunder upon performance of the Work in conformity with the terms of this Order. With regard to the activities undertaken pursuant to this Order, each contractor and subcontractor shall be deemed to be related by contract to Respondent within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3). Notwithstanding the terms of any contract, Respondent is responsible for compliance with this Order and for ensuring that its contractors, subcontractors and agents comply with this Order and perform any Work in accordance with this Order.

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IX. WORK TO BE PERFORMED

38. Respondent shall cooperate with EPA in providing information regarding the Work to the public. As requested by EPA, Respondent shall participate in the preparation of such information for distribution to the public and in public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site.

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1 39. Selection of Contractors, Personnel. All Work performed under this Order shall be under
2 the direction and supervision of qualified personnel. Prior to the execution of this Order,
3 Respondent provided EPA in writing with information sufficient to demonstrate the qualifications
4 of the personnel, including contractors, subcontractors, consultants and laboratories to be used in
5 carrying out the Work and EPA approved those individuals and entities. During the course of the
6 RI/FS, Respondent shall notify EPA in writing prior to making any changes or additions in the
7 personnel used to carry out such Work, providing their names, titles and qualifications, and any
8 changes or additions to the personnel will be subject to EPA's approval. If EPA disapproves in
9 writing of any replacement's or addition's technical qualifications, Respondent shall notify EPA
10 of the identity and qualifications of new proposed replacements or additions within thirty (30)
11 days of the written notice. If EPA again disapproves of a replacement or addition, Respondent
12 shall propose a new replacement or addition and the process shall continue until EPA approves a
13 replacement.

14 40. Within ten (10) days after the Effective Date, Respondent shall designate a Project
15 Coordinator who shall be responsible for administration of all actions by Respondent required by
16 this Order and shall submit to EPA the designated Project Coordinator's name, address, telephone
17 number, and qualifications. To the greatest extent possible, the Project Coordinator shall be
18 present on-Site or readily available during Site Work. EPA retains the right to disapprove of the
19 designated Project Coordinator. If EPA disapproves of the designated Project Coordinator,
20 Respondent shall retain a different Project Coordinator and shall notify EPA of that person's
21 name, address, telephone number and qualifications within fifteen (15) days following EPA's
22 disapproval. Respondent shall have the right to change its Project Coordinator, subject to EPA's
23 right to disapprove. Respondent shall notify EPA at least ten (10) days before such a change is
24 made. The initial notification may be made orally, but shall be promptly followed by a written
25 notification. Receipt by Respondent's Project Coordinator of any notice or communication from
26 EPA relating to this Order shall constitute receipt by Respondent.

27 41. EPA has designated Jim Sickles of the EPA Region IX Superfund Division as its RPM,
28 and Nadia Hollan-Burke as its alternate RPM if the designated RPM is unavailable. Except as

1 otherwise provided in this Order, Respondent shall direct all submissions required by this Order to
2 the RPM at:

3 Environmental Protection Agency, Region IX
4 75 Hawthorne Street (SFD-7)
5 San Francisco, CA 94105
6

7 And to:

8
9 Patrick Plumb, Project Manager
10 U.S. Bureau of Land Management
11 1340 Financial Boulevard
12 Reno, NV 89520

13 42. The RPM shall have the authority lawfully vested in an RPM by the NCP. In addition, the
14 RPM shall have the authority consistent with the NCP, to halt any Work required by this Order,
15 and to take any necessary response action when he determines that conditions at the Site may
16 present an immediate endangerment to public health or welfare or the environment. The absence
17 of the RPM from the area under study pursuant to this Order shall not be cause for the stoppage or
18 delay of Work.

19 43. EPA shall arrange for a qualified person to assist in its oversight and review of the conduct
20 of the RI and FS, as required by Section 104(a) of CERCLA, 42 U.S.C. Section 9604(a). Such
21 person shall have the authority to observe Work and make inquiries in the absence of EPA, but
22 not to modify the RI/FS Work Plan.

23 44. Performance of RI and FS. Respondent shall conduct the RI and FS in accordance with
24 the provisions of this Order, the SOW, CERCLA, the NCP and EPA guidance, including, but not
25 limited to the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility
26 Studies under CERCLA" (OSWER Directive # 9355.3-01, October 1988 or subsequently issued
27 guidance), "Guidance for Data Useability in Risk Assessment" (OSWER Directive #9285.7-05,
28 October 1990), and guidance referenced therein, and guidances referenced in the SOW, as may be
29 amended or modified by EPA. As specified in the SOW, the RI shall consist of collecting data to
30 characterize Site conditions, determining the nature and extent of the contamination at or from the
31 Site, assessing risk to human health and the environment and conducting treatability testing as

1 necessary to evaluate the potential performance and cost of the treatment technologies that are
2 being considered. As specified in the SOW, the FS shall determine and evaluate (based on
3 treatability testing, where appropriate) alternatives for remedial action to prevent, mitigate or
4 otherwise respond to or remedy the release or threatened release of hazardous substances,
5 pollutants, or contaminants at or from the Site. The alternatives evaluated must include, but shall
6 not be limited to, the range of alternatives described in the NCP, and shall include remedial
7 actions that utilize permanent solutions and alternative treatment technologies or resource
8 recovery technologies to the maximum extent practicable. In evaluating the alternatives,
9 Respondent shall address the factors required to be taken into account by Section 121 of
10 CERCLA, 42 U.S.C. § 9621, and Section 300.430(e) of the NCP, 40 C.F.R. § 300.430(e). On
11 request by EPA, Respondent shall submit in electronic form all portions of any plan, report or
12 other deliverable that Respondent is required to submit pursuant to provisions of this Order or the
13 SOW.

14 45. RI/FS Work Plans. Within ninety (90) days after the Effective Date of this Order,
15 Respondent shall submit to EPA the initial work plan as indicated in the SOW. Respondent shall
16 submit successive work plans in accordance with the schedule set forth in the SOW. On the
17 approval of any respective work plan by EPA pursuant to Paragraphs 61-7 (EPA Approval of
18 Plans and Other Submissions), the respective work plans shall be incorporated into and become
19 enforceable under this Order, and the cumulation of approved work plans shall be known as the
20 "RI/FS Work Plans."

21 46. Sampling and Analysis Plan. Within ninety (90) days after the Effective Date, Respondent
22 shall submit a Sampling and Analysis Plan for site specific Operable Units as called out in the
23 SOW to EPA for review and approval pursuant to Paragraphs 61-7 (EPA Approval of Plans and
24 Other Submissions). This plan shall consist of a Field Sampling Plan ("FSP") and a Quality
25 Assurance Project Plan ("QAPP"), to implement the SOW, and shall adhere to EPA guidances,
26 including, without limitation, "EPA Guidance for Quality Assurance Project Plans (QA/G-
27 5)" (EPA/600/R-02/009, December 2002), and "EPA Requirements for Quality Assurance Project
28 Plans (QA/R-5)" (EPA 240/B-01/003, March 2001). On its approval by EPA pursuant to Section

1 X (EPA Approval of Plans and Other Submissions), the Sampling and Analysis Plan shall be
2 incorporated into and become enforceable under this Order.

3 47. Site Health and Safety Plan. Within forty-five (45) days after the Effective Date of this
4 Order, Respondent shall submit for EPA review and comment a Site Health and Safety Plan that
5 ensures the protection of on-site workers and the public during performance of on-site Work
6 under this Order. This plan shall be prepared in accordance with EPA's Standard Operating
7 Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply
8 with all currently applicable Occupational Safety and Health Administration ("OSHA")
9 regulations found at 29 C.F.R. Part 1910. The plan also shall include contingency planning for
10 on-site emergencies. Respondent shall incorporate all changes to the plan recommended by EPA
11 and shall implement the plan during the pendency of the RI/FS.

12 48. Community Relations Plan and Technical Assistance Plan. EPA will prepare a
13 community relations plan, in accordance with EPA guidance and the NCP. As requested by EPA,
14 Respondent shall provide information supporting EPA's community relations plan and shall
15 participate in the preparation of such information for dissemination to the public and in public
16 meetings that may be held or sponsored by EPA to explain activities at or concerning the Site.
17 Within thirty (30) days of a request by EPA, Respondent shall provide a Technical Assistance
18 Plan ("TAP") for providing and administering up to \$50,000 of Respondent's funds to be used by
19 a qualified community group to hire independent technical advisers during the Work conducted
20 pursuant to this Order. The TAP shall state that Respondent will provide and administer any
21 additional amounts needed if EPA, in its discretion, determines that the selected community group
22 has demonstrated such a need prior to EPA's issuance of the Record of Decision contemplated by
23 this Order. On its approval by EPA pursuant to Paragraphs 61-7 (EPA Approval of Plans and
24 Other Submissions), the TAP shall be incorporated into and become enforceable under this Order.

25 49. Site Characterization. Respondent shall implement the provisions of the RI/FS Work
26 Plans and Sampling and Analysis Plan, to characterize the Site. Respondent shall complete Site
27 characterization and submit all plans, reports and other deliverables in accordance with the

schedules and deadlines established in this Order, the SOW, or as otherwise may be provided in the approved RI/FS Work Plans and Sampling and Analysis Plan.

50. Baseline Human Health Risk Assessment and Ecological Risk Assessment. Respondent will perform the Baseline Human Health Risk Assessment and Ecological Risk Assessment ("Risk Assessments") in accordance with the SOW, RI/FS Work Plan and applicable EPA guidance, including but not limited to: "Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A)," (RAGS, EPA-540-1-89-002, OSWER Directive 9285.7-01A, December 1989); "Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)," (RAGS, EPA 540-R-97-033, OSWER Directive 9285.7-01D, January 1998); "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments" (ERAGS, EPA-540-R-97-006, OSWER Directive 9285.7-25, June 1997).

51. Draft RI Report. Within one hundred twenty (120) days after notification to EPA of completion of field investigation activities, Respondent shall submit to EPA for review and approval pursuant to Paragraphs 61-7 (EPA Approval of Plans and Other Submissions), a Draft Remedial Investigation Report consistent with the SOW, RI/FS Work Plans, and the Sampling and Analysis Plan. The Draft RI Report shall also contain the Risk Assessments.

52. Treatability Studies. Respondent shall conduct treatability studies, except where Respondent can demonstrate to EPA's satisfaction that they are not needed. The major components of the treatability studies are described in the SOW. In accordance with the schedules or deadlines established in this Order, the SOW or the EPA-approved RI/FS Work Plans, Respondent shall provide EPA with the following plans, reports, and other deliverables for review and approval pursuant to Paragraphs 61-7 (EPA Approval of Plans and Other Submissions):

- (1) Identification of Candidate Technologies Memorandum. This memorandum shall be submitted within thirty (30) days after written determination by EPA of the need for a treatability study.

1 (2) Treatability Testing Statement of Work. If EPA determines that treatability testing is
2 required, within thirty (30) days thereafter, or as otherwise specified by EPA, Respondent
3 shall submit a Treatability Testing Statement of Work ("TTSOW").

4 (3) Treatability Testing Work Plan. Within sixty (60) days after submission of the
5 TTSOW, Respondent shall submit a Treatability Testing Work Plan, including a schedule.

6 (4) Treatability Study Sampling and Analysis Plan. Within ninety (90) days after
7 identification of the need for a separate or revised QAPP or FSP, Respondent shall submit
8 a Treatability Study Sampling and Analysis Plan.

9 (5) Treatability Study Site Health and Safety Plan. Within ninety (90) days after the
10 identification of the need for a revised Health and Safety Plan, Respondent shall submit a
11 Treatability Study Site Health and Safety Plan.

12 (6) Treatability Study Evaluation Report. Within 90 days after completion of any
13 treatability testing, Respondent shall submit a treatability study evaluation report as
14 provided in the Statement of Work and Work Plan.

15 53. Development and Screening of Alternatives. Respondent shall develop an appropriate
16 range of waste management options that will be evaluated through the development and screening
17 of alternatives, as provided in the SOW and RI/FS Work Plans. In accordance with the schedules
18 or deadlines established in this Order, the SOW or the EPA-approved RI/FS Work Plans,
19 Respondent shall provide EPA with the following deliverables for review and approval pursuant
20 to Paragraphs 61-7 (EPA Approval of Plans and Other Submissions):

21 (1) Memorandum on Remedial Action Objectives. The Memorandum on Remedial
22 Action Objectives shall include remedial action objectives for Engineering Controls as
23 well as for Institutional Controls.
//

(2) Memorandum on Development and Screening of Alternatives. The Memorandum shall summarize the development and screening of remedial alternatives.

54. Detailed Analysis of Alternatives. Respondent shall conduct a detailed analysis of remedial alternatives, as described in the SOW and RI/FS Work Plans. In accordance with the deadlines or schedules established in this Order, the SOW or the EPA-approved RI/FS Work Plans, Respondent shall provide EPA with the following deliverables and presentation for review and approval pursuant to Paragraphs 61-7 (EPA Approval of Plans and Other Submissions):

(1) Report on Comparative Analysis and Presentation to EPA. Within sixty (60) days after approval of the draft remedial investigation report and EPA's written determination that an FS is necessary, Respondent will submit a report on comparative analysis to EPA. Within thirty (30) days of submitting the report on comparative analysis, Respondent will present to EPA a summary of the findings of the remedial investigation and remedial action objectives, and present the results of the nine criteria evaluation and comparative analysis, as described in the SOW.

(2) Alternatives Analysis for Institutional Controls and Screening. Respondent shall submit a memorandum on the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives as potential remedial actions. The Alternatives Analysis for Institutional Controls and Screening shall: (1) state the objectives (i.e., what will be accomplished) for the Institutional Controls; (2) determine the specific types of Institutional Controls that can be used to meet the remedial action objectives; (3) investigate when the Institutional Controls need to be implemented or secured and how long they must be in place; and (4) research, discuss and document any agreement with the proper entities (e.g., state, local government entities, local landowners, conservation organizations, Respondent) on exactly who will be responsible for securing, maintaining and enforcing the Institutional Controls. The Alternatives Analysis for Institutional Controls and Screening shall also evaluate the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives against the nine evaluation criteria outlined in the NCP (40 C.F.R. 300.430(e)(9)(iii)) for CERCLA.

1 cleanups, including but not limited to costs to implement, monitor or enforce the
2 Institutional Controls. The Alternatives Analysis for Institutional Controls and Screening
3 shall be submitted as an appendix to the Draft Feasibility Study Report.

4 (3) Draft Feasibility Study Report. Within ninety (90) days after the presentation to EPA
5 described in Paragraph 54(i)(1) and EPA's approval of the remedial alternatives screening
6 summary, Respondent shall submit to EPA a Draft FS Report that reflects the findings in
7 the Risk Assessments. Respondent shall refer to Table 6-5 of the RI/FS Guidance for
8 report content and format. The report, as amended, and the administrative record, shall
9 provide the basis for the proposed plan under Sections 113(k) and 117(a) of CERCLA, 42
10 U.S.C. §§ 9613(k) and 9617(a), and shall document the development and analysis of
11 remedial alternatives.

12 55. On receipt of the Draft FS report, EPA will evaluate, as necessary, the estimates of the risk
13 to the public and environment that are expected to remain after a particular remedial alternative
14 has been completed and will evaluate the durability, reliability and effectiveness of any proposed
15 Institutional Controls.

16 56. Modification of the RI/FS Work Plans.

17 a. If at any time during the RI or FS process, Respondent identifies a need for
18 additional data, including potential reuse or operation of mining activities at the Site, Respondent
19 shall submit a memorandum documenting the need for additional data to the RPM within sixty
20 (60) days of identification. EPA in its discretion will determine whether the additional data will
21 be collected by Respondent and whether it will be incorporated into any respective plans, reports
22 and other deliverables.

23 b. In the event of unanticipated or changed circumstances at the Site, Respondent
24 shall notify the RPM by telephone within twenty-four (24) hours of discovery of the unanticipated
25 or changed circumstances. In the event that EPA determines that the immediate threat or the
26 unanticipated or changed circumstances warrant changes in the RI/FS Work Plans, EPA may
27 modify or amend the RI/FS Work Plans in writing accordingly, or may require Respondent to

1 modify the RI/FS Work Plans subject to EPA's approval in accordance with Paragraphs 61-7
2 (EPA Approval of Plans and Other Submissions). Respondent shall perform the modified or
3 amended RI/FS Work Plans as provided or approved by EPA.

4 c. EPA may determine that in addition to tasks defined in any of the initially
5 approved RI/FS Work Plans, other additional Work may be necessary to accomplish the
6 objectives of this Order. Respondent shall perform these response actions in addition to those
7 required any of the initially approved RI/FS Work Plans, including any approved modifications, if
8 EPA determines that such actions are necessary to meet the purpose of this Order.

9 d. Respondent shall confirm its willingness to perform the additional Work in
10 writing to EPA within fourteen (14) days of receipt of any EPA request.

11 e. Respondent shall complete the additional Work according to the standards,
12 specifications, and schedule set forth or approved by EPA in a written modification to the RI/FS
13 Work Plans or any written supplement. EPA reserves the right to conduct the Work itself at any
14 point, to seek reimbursement from Respondent, or to seek any other appropriate relief.

15 f. Nothing in this Paragraph shall be construed to limit EPA's authority to require
16 performance of further response actions at the Site.

17 57. Off-Site Shipment of Waste Material. Respondent shall, prior to any off-Site shipment of
18 hazardous substances from the Site to an out-of-state waste management facility, provide written
19 notification of such shipment of hazardous substances to the appropriate state environmental
20 official in the receiving facility's state and to EPA's RPM. However, this notification
21 requirement shall not apply to any off-Site shipments when the total volume of all such shipments
22 will not exceed 10 cubic yards.

23 a. Respondent shall include in the written notification the following information:
24 (1) the name and location of the facility to which the hazardous substances are to be shipped; (2)
25 the type and quantity of the hazardous substances to be shipped; (3) the expected schedule for the

shipment of the hazardous substances; and (4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the hazardous substances to another facility within the same state, or to a facility in another state.

b. Respondent shall provide the information required by this Paragraph to its respective contractors as soon as practicable after the award of the contract and before the hazardous substances are actually shipped.

c. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-Site location, Respondent shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall send hazardous substances, pollutants, or contaminants from the Site only to an off-Site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

58. Meetings. Respondent shall make presentations at, and participate in, meetings at the request of EPA during the initiation, conduct, and completion of the RI and FS. In addition to discussion of the technical aspects of the RI and FS, topics will include anticipated problems or new issues. Meetings will be scheduled at EPA's discretion.

59. Progress Reports. In addition to the plans, reports and other deliverables set forth in this Order, Respondent shall provide to EPA monthly progress reports by the fifteenth (15th) day of the following month. At a minimum, with respect to the preceding month, these progress reports shall: (1) describe the actions that have been taken to comply with this Order during that month; (2) include all results of sampling and tests and all other data received by Respondent; (3) describe Work planned for the next two months with schedules relating such Work to the overall project schedule for RI and FS completion; and (4) describe all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

1 60. Emergency Response and Notification of Releases.

2 a. In the event of any action or occurrence during performance of the Work that
3 causes or threatens a release of Waste Material from the Site, that constitutes an emergency
4 situation or may present an immediate threat to public health or welfare or the environment,
5 Respondent shall immediately take all appropriate action. Respondent shall take these actions in
6 accordance with all applicable provisions of this Order, including, but not limited to, the Health
7 and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or
8 threatened by the release. Respondent also shall immediately notify the EPA RPM, in the event of
9 his unavailability, the Regional Duty Officer at (888) 254-3130, of the incident or Site conditions.
10 In the event that Respondent fails to take appropriate response action as required by this
11 Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA all costs of the
12 response action not inconsistent with the NCP.

13 b. Respondent shall submit a written report to EPA within seven (7) days after each
14 such release, setting forth the events that occurred and the measures taken or to be taken to
15 mitigate any release or endangerment caused or threatened by the release and to prevent the
16 reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, any
17 reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the
18 Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq.*

19 61. EPA Approval of Plans and Other Submissions. After review of any plan, report or other
20 item that is required to be submitted for approval pursuant to this Order, in a notice to Respondent
21 EPA shall: (a) approve, in whole or in part, the submission; (b) approve the submission subject to
22 specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole
23 or in part, the submission, and direct that Respondent modify the submission; or (e) any
24 combination of the above. However, EPA shall not modify a submission without first providing
25 Respondent at least one notice of deficiency and an opportunity to cure within fifteen (15) days,
26 except where to do so would cause serious disruption to the Work or where previous
27 submission(s) have been disapproved due to material defects.

1 62. On approval, approval subject to conditions, or modification by EPA, pursuant to
2 Paragraph 61, Respondent shall proceed to implement any action required by the plan, report or
3 other deliverable, as approved or modified by EPA. Following EPA approval or modification of a
4 submission or portion thereof, Respondent shall not thereafter alter or amend such submission or
5 portion thereof unless directed by EPA.

6 63. On receipt of a notice of disapproval, Respondent shall, within fifteen (15) days or such
7 longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan,
8 report, or other deliverable for approval. Notwithstanding the receipt of a notice of disapproval,
9 Respondent shall proceed to take any action required by any non-deficient portion of the
10 submission, unless otherwise directed by EPA. Respondent shall not proceed with any activities
11 or tasks until receiving EPA approval, approval on condition or modification. While awaiting
12 EPA approval, approval on condition or modification of deliverables, Respondent shall proceed
13 with all other tasks and activities that may be conducted independently in accordance with the
14 schedule set forth under this Order. Respondent shall continue implementation of any activities or
15 tasks regarding the Site that EPA approved prior to issuing this Order; however, EPA reserves the
16 right to stop Respondent from proceeding, either temporarily or permanently, on any task, activity
17 or deliverable at any point during the RI or FS.

18 64. If EPA disapproves a resubmitted plan, report or other deliverable, or portion thereof, EPA
19 may again direct Respondent to correct the deficiencies. EPA also shall retain the right to modify
20 or develop the plan, report or other deliverable, and Respondent shall implement any such plan,
21 report, or deliverable as ultimately corrected, modified or developed by EPA.

22 65. In the event that EPA takes over some of the tasks, but not the preparation of the RI
23 Report or the FS Report, Respondent shall incorporate and integrate information supplied by EPA
24 into the final reports.

25 66. All plans, reports, and other deliverables submitted to EPA under this Order shall, on
26 approval or modification by EPA, be incorporated into and enforceable under this Order. In the
27 event EPA approves or modifies a portion of a plan, report, or other deliverable submitted to EPA

1 under this Order, the approved or modified portion shall be incorporated into and enforceable
2 under this Order.

3 67. Neither failure of EPA to expressly approve or disapprove of Respondent's submissions
4 within a specified time period, nor the absence of comments, shall be construed as approval by
5 EPA. Regardless of whether EPA gives express approval for Respondent's deliverables,
6 Respondent is responsible for preparing deliverables acceptable to EPA.

7 68. Quality Assurance, Sampling, and Access to Information.

8 a. Quality Assurance. Respondent shall assure that Work performed, samples
9 taken and analyses conducted conform to the requirements of the SOW, the QAPP and guidances
10 identified therein. Respondent will assure that field personnel used by Respondent are properly
11 trained in the use of field equipment and in chain of custody procedures. Respondent shall only
12 use laboratories that have a documented quality system that complies with "EPA Requirements
13 for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent
14 documentation as determined by EPA.

15 b. Sampling. All results of sampling, tests, modeling or other data (including raw
16 data) generated by Respondent, or on Respondent's behalf, during the period that this Order is
17 effective, shall be submitted to EPA in the next monthly progress report as described in Paragraph
18 59 of this Order. EPA will make available to Respondent validated data generated by EPA unless
19 it is exempt from disclosure by any federal or state law or regulation. Respondent shall verbally
20 notify EPA at least fifteen (15) days prior to conducting significant field events as described in the
21 SOW, RI/FS Work Plans or Sampling and Analysis Plan. At EPA's verbal or written request, or
22 the request of EPA's oversight assistant, Respondent shall allow split or duplicate samples to be
23 taken by EPA (and its authorized representatives) of any samples collected in implementing this
24 Order. All split samples shall be analyzed by the methods identified in the QAPP.

25 c. Access to Information. EPA is responsible for the release to the public of
26 documents or reports through any phase of the RI or FS. EPA will determine the contents of the
27 administrative record file for selection of any response action. Respondent shall provide to EPA,

1 on request, copies of all documents and information within its possession or control or that of its
2 contractors or agents relating to activities at the Site or to the implementation of this Order,
3 including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking
4 logs, receipts, reports, sample traffic routing, correspondence, or other documents or information
5 related to the Work. Respondent also shall make available to EPA, for purposes of investigation,
6 information gathering, or testimony, its employees, agents, or representatives with knowledge of
7 relevant facts concerning the performance of the Work. Respondent may assert business
8 confidentiality claims covering part or all of the documents or information submitted to EPA
9 under this Order to the extent permitted by and in accordance with Section 104 of CERCLA, 42
10 U.S.C. § 9604, and 40 C.F.R. § 2.203(b). Documents or information determined to be
11 confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no
12 claim of confidentiality accompanies documents or information when they are submitted to EPA,
13 or if EPA has notified Respondent that the documents or information are not confidential under
14 the standards of Section 104 of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given
15 access to such documents or information without further notice to Respondent. Respondent shall
16 segregate and clearly identify all documents or information submitted under this Order for which
17 Respondent asserts business confidentiality claims. Respondent may assert that certain
18 documents, records and other information are privileged under the attorney-client privilege or any
19 other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of
20 providing documents, it shall provide EPA with the following: 1) the title of the document,
21 record, or information; 2) the date of the document, record, or information; 3) the name and title
22 of the author of the document, record, or information; 4) the name and title of each addressee and
23 recipient; 5) a description of the contents of the document, record, or information; and 6) the
24 privilege asserted by Respondent. However, no documents, reports or other information created
25 or generated pursuant to the requirements of this Order shall be withheld on the grounds that they
26 are privileged. No claim of confidentiality or privilege shall be made with respect to any data,
27 including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific,
28 chemical, or engineering data.

29 d. Documents Supporting EPA Selection of Remedy. Respondent must submit to
30 EPA documents developed during the course of the RI or FS upon which selection of a response

1 action may be based. Respondent shall provide copies of plans, task memoranda for further
2 action, quality assurance memoranda and audits, raw data, field notes, laboratory analytical
3 reports and other reports. Respondent must additionally submit any previous studies conducted
4 under state, local or other federal authorities relating to selection of the response action, and all
5 communications between Respondent and state, local or other federal authorities concerning
6 selection of the response action.

7 69. Site Access. If the Site, or any other property where access is needed to implement this
8 Order, is owned or controlled by Respondent, Respondent shall, commencing on the Effective
9 Date, provide EPA and its representatives, including contractors, with access at all reasonable
10 times to the Site, or such other property, for the purpose of conducting any activity related to this
11 Order, including: (a) inspecting conditions, activities, the results of activities, records, operating
12 logs, and contracts related to the Work or Respondent and its representatives or contractors
13 pursuant to this Order; (b) reviewing the progress of Respondent in carrying out the terms of this
14 Order; (c) conducting tests as EPA or its authorized representatives or contractors deem
15 necessary; (d) using a camera, sound recording device or other documentary type equipment; and
16 (e) verifying the data submitted to EPA by Respondent. Where any action under this Order is to
17 be performed in areas owned by or in possession of someone other than Respondent, Respondent
18 shall use its best efforts to obtain all necessary access agreements. Respondent shall immediately
19 notify EPA if, after using its best efforts, it is unable to obtain such agreements. For purposes of
20 this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration
21 of access. Respondent shall describe in writing its efforts to obtain access. If Respondent cannot
22 obtain access agreements, EPA may either: (i) obtain access for Respondent or assist Respondent
23 in gaining access to the extent necessary to effectuate the response actions described herein, using
24 such means as EPA deems appropriate; or (ii) perform those tasks or activities with EPA
25 contractors. Except as provided above in this Paragraph, Respondent shall reimburse EPA for all
26 costs and attorney's fees incurred by the United States in obtaining such access. If EPA performs
27 those tasks or activities with EPA contractors, Respondent shall perform all other tasks or
28 activities not requiring access to that property, and shall reimburse EPA for all costs incurred in
29 performing such tasks or activities. Respondent shall integrate the results of any such tasks or
30 activities undertaken by EPA into its plans, reports and other deliverables. Notwithstanding any

1 provision of this Order, EPA retains all of its access authorities and rights, including enforcement
2 authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or
3 regulations.

4 70. Compliance with Other Laws and the NCP. Respondent shall comply with all applicable
5 local, state and federal laws and regulations when performing the RI and FS. EPA has determined
6 that the activities contemplated by this Order are consistent with the NCP. No local, state, or
7 federal permit shall be required for any portion of any action conducted entirely on-Site, including
8 studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42
9 U.S.C. § 9621. Where any portion of the Work is to be conducted off-Site and requires a federal
10 or state permit or approval, Respondent shall submit timely and complete applications and take all
11 other actions necessary to obtain and to comply with all such permits or approvals. This Order is
12 not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or
13 regulation.

14 71. Retention of Records. a. During the pendency of this Order and for a minimum of ten
15 (10) years after commencement of construction of any remedial action, Respondent shall preserve
16 and retain all non-identical copies of documents, records, and other information (including
17 documents, records, or other information in electronic form) now in its possession or control or
18 that come into its possession or control that relate in any manner to the performance of the Work
19 or the liability of any person under CERCLA with respect to the Site, regardless of any corporate
20 retention policy to the contrary. Until ten (10) years after commencement of construction of any
21 remedial action, Respondent also shall instruct its contractors and agents to preserve all
22 documents, records, and other information of whatever kind, nature or description relating to
23 performance of the Work. At the conclusion of this document retention period, Respondent shall
24 notify EPA at least ninety (90) days prior to the destruction of any such documents, records or
25 other information, and, on request by EPA, Respondent shall deliver any such documents, records,
26 or other information to EPA, at no cost to EPA. Respondent may assert that certain documents,
27 records, and other information are privileged under the attorney-client privilege or any other
28 privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide EPA
29 with the following: 1) the title of the document, record, or other information; 2) the date of the

document, record, or other information; 3) the name and title of the author of the document, record, or other information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or other information; and 6) the privilege asserted by Respondent. However, no documents, records or other information created or generated pursuant to the requirements of this Order shall be withheld on the grounds that they are privileged.

X. DELAY IN PERFORMANCE

72. Any delay in performance of this Order that, in EPA's discretion, is not properly justified by Respondent under the terms of this Section shall be considered a violation of this Order. Any delay in performance of this Order shall not affect Respondent's obligations to fully perform all obligations under the terms and conditions of this Order.

73. Respondent shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone to EPA's RPM within forty-eight (48) hours after Respondent first knew or should have known that a delay might occur. Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Within five (5) business days after notifying EPA by telephone, Respondent shall provide written notification fully describing the nature of the delay, any justification for delay, any reason why Respondent should not be held strictly accountable for failing to comply with any relevant requirements of this Order, the measures planned and taken to minimize the delay, and a schedule for implementing the measures that will be taken to mitigate the effect of the delay. EPA may, in its sole and unreviewable discretion, grant an extension of any schedule for good cause shown. Increased costs or expenses associated with implementation of the activities called for in this Order are not a justification for any delay in performance.

XI. ASSURANCE OF ABILITY TO COMPLETE WORK

74. Within thirty (30) days of the Effective Date, Respondent shall establish and maintain financial security for the benefit of EPA in one or more of the following forms, in order to secure the full and final completion of Work by Respondent:

1 a. a surety bond unconditionally guaranteeing payment and/or performance of the
2 Work;

3 b. one or more irrevocable letters of credit, payable to or at the direction of EPA,
4 issued by financial institution(s) acceptable in all respects to EPA equaling the total
5 estimated cost of the Work;

6 c. a trust fund administered by a trustee acceptable in all respects to EPA;

7 d. a policy of insurance issued by an insurance carrier acceptable in all respects to
8 EPA, which ensures the payment or performance of the Work;

9 e. a corporate guarantee to perform the Work provided by one or more parent or
10 affiliated corporations or subsidiaries of Respondent, including a demonstration
11 that any such company satisfies the financial test requirements of 40 C.F.R. Part
12 264.143(f); or

13 f. a corporate guarantee to perform the Work by Respondent, including a
14 demonstration that it satisfies the requirements of 40 C.F.R. Part 264.143(f).

15 75. Any and all financial assurance instruments provided pursuant to this Section shall be in
16 form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that
17 EPA determines at any time that the financial assurances provided pursuant to this Section
18 (including, without limitation, the instrument(s) evidencing such assurances) are inadequate,
19 Respondent shall, within thirty (30) days of receipt of notice of EPA's determination, obtain and
20 present to EPA for approval one of the other forms of financial assurance listed in Paragraph 74,
21 above. In addition, if at any time EPA notifies Respondent that the anticipated cost of completing
22 the Work has increased, then, within thirty (30) days of such notification, Respondent shall obtain
23 and present to EPA for approval a revised form of financial assurance (otherwise acceptable under
24 this Section) that reflects such cost increase. Respondent's inability to demonstrate financial

1 ability to complete the Work shall in no way excuse performance of any activities required under
2 this Order.

3 76. If Respondent seeks to ensure completion of the Work through a guarantee pursuant to
4 Paragraph 74(e) or 74(f) of this Order, Respondent shall: (i) demonstrate to EPA's satisfaction
5 that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f); and (ii) resubmit sworn
6 statements conveying the information required by 40 C.F.R. Part 264.143(f) annually, on the
7 anniversary of the Effective Date, to EPA. For the purposes of this Order, wherever 40 C.F.R.
8 Part 264.143(f) references "sum of current closure and post-closure costs estimates and the current
9 plugging and abandonment costs estimates," the current cost estimate of \$18,000,000 for the
10 Work at the Site shall be used in relevant financial test calculations.

11 77. If, after the Effective Date, Respondent can show that the estimated cost to complete the
12 remaining Work has diminished below the amount set forth in Paragraph 76, Respondent may, on
13 any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the
14 amount of the financial security provided under this Section to the estimated cost of the remaining
15 Work to be performed. Respondent shall submit a proposal for such reduction to EPA, in
16 accordance with the requirements of this Section, and may reduce the amount of the security after
17 receiving written approval from EPA.

18 78. Respondent may change the form of financial assurance provided under this Section at any
19 time, on notice to and prior written approval by EPA, provided that EPA determines that the new
20 form of assurance meets the requirements of this Section.

21 XII INSURANCE

22 79. At least five (5) days prior to commencing any On-Site Work under this Order,
23 Respondent shall secure, and shall maintain for the duration of this Order, comprehensive general
24 liability insurance and automobile insurance with limits of \$2,000,000 dollars, combined single
25 limit, naming the EPA as an additional insured. Within the same period, Respondent shall
26 provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent

1 shall submit such certificates and copies of policies each year on the anniversary of the Effective
2 Date. In addition, for the duration of the Order, Respondent shall satisfy, or shall ensure that its
3 contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of
4 workers' compensation insurance for all persons performing the Work on behalf of Respondent in
5 furtherance of this Order. If Respondent demonstrates by evidence satisfactory to EPA that any
6 contractor or subcontractor maintains insurance equivalent to that described above, or insurance
7 covering some or all of the same risks but in an equal or lesser amount, then Respondent need
8 provide only that portion of the insurance described above that is not maintained by such
9 contractor or subcontractor.

10 XIII. REIMBURSEMENT OF RESPONSE COSTS

11 80. Respondent shall reimburse EPA, on written demand, for all response costs incurred by
12 the United States in overseeing Respondent's implementation of the requirements of this Order or
13 in performing any response action which Respondent fails to perform in compliance with this
14 Order. Response costs are all costs including, but not limited to, direct and indirect costs and
15 interest, that EPA incurs in overseeing Respondent's implementation of the requirements of this
16 Order, including development of this Order, reviewing or developing plans, reports and other
17 items pursuant to this Order, verifying the Work, or otherwise implementing, overseeing, or
18 enforcing this Order or in performing any response action which Respondent fails to perform in
19 compliance with this Order.

20 81. On a periodic basis, EPA may submit to Respondent bills for response costs that include
21 an itemized Cost Summary.

22
23 82. Respondent shall, within thirty (30) days of receipt of each bill, remit a certified or
24 cashier's check for the amount of those costs. Interest shall accrue from the later of the date that
25 payment of a specified amount is demanded in writing or the date of the expenditure. The interest
26 rate is the rate established by the Department of the Treasury pursuant to 31 U.S.C. § 3717 and 4
27 C.F.R. § 102.13.

83. The Respondent shall make payments payable to "EPA Hazardous Substance Superfund" and mail payments to U.S. EPA - Region 9, ATTN: Superfund Accounting, P.O. Box 371099M, Pittsburgh, PA 15251. The payment to EPA may instead be made by Electronic Funds Transfer ("EFT" or "wire transfer") in accordance with instructions provided by the RPM to the Respondent in the first bill for response costs. Any EFT received after 11:00 A.M. (Eastern Time) will be credited on the next business day. The Respondent shall send written notice of the EFT to the RPM. All payments to the United States under this Paragraph shall reference the name and address of the party making payment, the Anaconda/Yerington Copper Mine Site, Site # 09GU and EPA Docket # 2007-0005.

84. Respondent shall simultaneously transmit a copy of any check to EPA's RPM.

85. In the event that the payments for response costs are not made as required above, Respondent shall pay interest on the unpaid balance. Interest is established at the rate specified in Section 107(a) of CERCLA. Interest shall accrue at the rate specified through the date of the payment. Payments of interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section.

XIV. UNITED STATES NOT LIABLE

86. The United States, by issuance of this Order, assumes no liability for any injuries or damages to persons or property resulting from acts or omissions by Respondent, or its directors, officers, employees, agents, representatives, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. Neither EPA nor the United States may be deemed to be a party to any contract entered into by Respondent or their directors, officers, employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order.

87. In any agreement that Respondent enters with third parties to undertake the terms of this Order, including any access agreements, Respondent shall save and hold harmless the United

1 States and its officials, agents, employees, contractors, subcontractors, or representatives for or
2 from any and all claims or causes of action or other costs incurred by the United States, including
3 but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on
4 account of acts or omissions of Respondent, its officers, directors, employees, agents, contractors,
5 subcontractors and any persons acting on their behalf or under their control, in carrying out
6 activities pursuant to this Order, including any claims arising from any designation of Respondent
7 as EPA's authorized representatives under Section 104(e) of CERCLA, 40 U.S.C. § 9604(e).

8 XV. ENFORCEMENT AND RESERVATIONS

9
10 88. EPA reserves the right to bring an action against Respondent under Section 107 of
11 CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States and
12 not reimbursed by Respondent. This reservation shall include, but not be limited to, past costs,
13 direct costs, indirect costs, the costs of oversight, and the costs of compiling the cost
14 documentation to support oversight cost demand, as well as accrued interest as provided in
15 Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

16 89. Notwithstanding any other provision of this Order, at any time during the response action,
17 EPA may perform its own studies, complete the response action, or any portion thereof, as
18 provided in CERCLA and the NCP, and seek reimbursement from Respondent for its costs, or
19 seek any other appropriate relief.

20 90. Nothing in this Order shall preclude EPA from taking any additional enforcement actions,
21 including modification of this Order or issuance of additional orders, and remedial or removal
22 actions as EPA may deem necessary, or from requiring Respondent in the future to perform
23 additional activities pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), *et seq.*, or any
24 other applicable law. Respondent shall be liable under CERCLA Section 107(a), 42 U.S.C.
25 § 9607(a), for the costs of any such additional actions.

1 91. Notwithstanding any provision of this Order, the United States hereby retains all of its
2 information gathering, inspection and enforcement authorities and rights under CERCLA, RCRA
3 and any other applicable statutes or regulations.

4 92. Respondent shall be subject to civil penalties under Section 106(b) of CERCLA, 42
5 U.S.C. § 9606(b), of not more than \$32,500 for each day that Respondent willfully violates, or
6 fails or refuses to comply with this Order without sufficient cause. In addition, failure to properly
7 provide response actions under this Order, or any portion hereof, without sufficient cause, may
8 result in liability under Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), for punitive
9 damages in an amount at least equal to, and not more than three times the amount of any costs
10 incurred by the Fund as a result of such failure to take proper action.

11 93. Nothing in this Order shall constitute or be construed as a release from any claim, cause of
12 action or demand in law or equity against any person for any liability it may have arising out of or
13 relating in any way to the Site.

14 94. If a court issues an order that invalidates any provision of this Order or finds that
15 Respondent has sufficient cause not to comply with one or more provisions of this Order,
16 Respondent shall remain bound to comply with all provisions of this Order not invalidated by the
17 court's order.

18 XVI. EFFECTIVE DATE AND COMPUTATION OF TIME

19 95. This Order shall be effective ten (10) days after it is signed by the Branch Chief in EPA's
20 Superfund Division. All times for performance of ordered activities shall be calculated from this
21 Effective Date unless otherwise stated.

XVII. OPPORTUNITY TO CONFER

96. Within five (5) days after receipt of this Order, Respondent may request a conference regarding the provisions of this Order. EPA shall deem a failure to request a conference as a waiver of the opportunity to confer prior to the Effective Date.

97. If requested, the conference shall occur prior to the Effective Date provided in Section XVI, unless the Effective Date and conference date are extended by mutual agreement of the Parties, at EPA's Regional Office at 75 Hawthorne Street, San Francisco, California. The conference shall be with EPA's Superfund Division Branch Chief, or whomever the Branch Chief may designate.

98. At any conference held pursuant to this Section, Respondent may appear in person, or be represented by an attorney or other representatives. The purpose and scope of any such conference held pursuant to this Order shall be limited to issues involving the actions required by this Order and the extent to which Respondent intends to comply with this Order. If a conference is held, Respondent may present any evidence, arguments or comments regarding this Order, its applicability, any factual determinations on which the Order is based, the appropriateness of any action that the Respondent is ordered to take, or any other relevant and material issue. Any such evidence, arguments or comments should be reduced to writing and submitted to EPA within three (3) days following the conference. The conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent a right to seek review of this Order or to seek resolution of potential liability, and EPA will make no official record of the conference. If Respondent does not request a conference, any evidence, arguments or comments may be submitted in writing within three (3) days following the Effective Date of this Order. Any such writing should be directed to the following address:

J. Andrew Helmlinger
Environmental Protection Agency
75 Hawthorne Street, ORC-3
San Francisco, CA 94105
(415) 972-3904

1 99. Requests for a conference may be made by telephone followed by written confirmation
2 mailed that day to EPA's RPM.

3 XVIII. NOTICE OF COMPLETION OF WORK

4 100. When EPA determines that all Work has been fully performed in accordance with this
5 Order, with the exception of any continuing obligations required by this Order (such as the
6 retention of records), EPA will provide written notice to Respondent. If EPA determines that any
7 such Work has not been completed in accordance with this Order, EPA will notify Respondent,
8 provide a list of the deficiencies, and require that Respondent modify the RI/FS Work Plans as
9 appropriate to correct such deficiencies, in accordance with Paragraph 61. Failure by Respondent
10 to implement the approved modified RI/FS Work Plans shall be a violation of this Order.

11 So Ordered, this 12th day of January 2007.

12 BY: 

13 Kathleen Johnson

14 Federal Facilities Branch Chief, Superfund Division

15 U.S. Environmental Protection Agency, Region IX

---ATTACHMENT A---

**SCOPE OF WORK FOR REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES
CONTINUED RESPONSE ACTION**

**Anaconda Copper/Yerington Mine Site
Lyon County, Nevada**

SECTION 1.0 SCOPE OF WORK

This Scope of Work ("SOW") is Attachment A to, and incorporated as part of, the Administrative Order on Consent ("AOC") between the United States and the Atlantic Richfield Company ("ARC") in the matter captioned as *United States v. Atlantic Richfield Company, et al.*, ("Respondent") regarding the release of hazardous substances at the Anaconda Copper/Yerington Mine Site, Lyon County, Nevada ("Site"). The purpose of this SOW is to conduct a comprehensive Remedial Investigation/Feasibility Study ("RI/FS") of the Site, except for the Arimetco Facilities (as that term is defined in the AOC) which will be handled separately, in support of potential Remedial Design and Remedial Actions if found necessary, and the continuation of on-going Response Actions for the Site. In designing, implementing and submitting deliverables for the ongoing response action at the Site, Respondents shall follow this SOW, the appropriate U.S. Environmental Protection Agency ("EPA") Superfund Guidance for Remedial Investigations and Feasibility Studies, Remedial Design, and Remedial Action, all approved plans, any additional guidance provided by EPA, and the provisions of the AOC.

1.1 General Provisions

Definitions

The definitions set forth in the AOC are incorporated herein by reference and shall apply to this SOW unless expressly provided otherwise herein.

Utilization of Existing Reports and Work Plans Prepared under the Memorandum of Understanding, dated 2002

Existing Work Plans and reports prepared under the Memorandum of Understanding ("MOU") dated 2002 between ARC, Nevada Division of Environmental Protection ("NDEP"), EPA and Bureau of Land Management ("BLM") shall be reviewed, and relevant information used in the completion of the activities listed in this SOW. Documents specific to each of the listed Operable Units ("OUs") are provided in this SOW.

Existing reports and Work Plans that cover site wide media or unique types of contamination should also be reviewed and relevant information used. These documents addressed 1) fugitive dust, as presented in the *Final Draft Fugitive Dust Work Plan*, dated November 20, 2002; 2) site wide air monitoring as presented in the *Air Quality Monitoring Work Plan for the Yerington Mine Site*, dated December 19, 2005 and *Air Quality Monitoring Data Summary Report for the Yerington Mine Site, First Quarter 2005*, dated May 10, 2005 and *Second Quarter 2005 Air Quality Monitoring Report Yerington Mine Site*, dated November 1, 2005 and *Addenda to First and Second Quarter 2005 Air Quality Monitoring Reports Yerington Mine Site*, dated November 28, 2005 and *Third Quarter 2005 Air Quality Monitoring Report Yerington Mine Site*, dated January 11, 2006; 3) radiological contamination as presented in the *Final Radiological Monitoring Report October 2004 – April 2005, Yerington Mine Site Investigation Operations, Lyon County, Nevada*, dated October 10, 2005 and *Radiological Data Compilation Yerington Mine Site*, dated December 15, 2005; 4) ambient levels at the site as presented in the *Draft Ambient Conditions Work Plan*, dated February 9, 2006; and site wide related documents: *Community Relations Plan for the Yerington Mine Site, Lyon County, Nevada*, dated October 10, 2002 and *Draft Final Conceptual Site Model for the Yerington Mine Site*, dated August 26, 2002, and *Quality Assurance Project Plan*, dated September 19, 2003 and *Site Health and Safety Plan Yerington Mine Site Closure Yerington Mine Site Lyon County, Nevada*, Revision 4, September 1, 2004 and *Radiological and Chemical Exposure Plan*, November 2004.

EPA and Respondent shall meet, as needed, to discuss the development of Work Plans for specific OUs and associated RI/FS activities. Additional meetings or conference calls will be scheduled as needed to provide updates on investigation progress or technical issues, risk assessment results, alternatives analysis and results of feasibility studies.

1.2 RI/FS Activities and Operable Units

RI/FS investigations for specific OUs and related Site-wide activities included in this SOW include characterizing the nature and extent of contamination, and assessing potential human health and ecological risks, and are designed to allow for the OU-specific and Site-wide RI/FS activities to be performed in a consistent and comprehensive manner. To achieve this objective, Respondent shall update or develop the following four documents:

- Site-wide Quality Assurance Project Plan (“QAPP”)
- Site-wide Health and Safety Plan (“HASP”)
- Site-wide Data Management Plan (“DMP”)
- Conceptual Site Model (“CSM”)
- Site-wide Groundwater Monitoring Plan

All but the DMP and Site-Wide Groundwater Monitoring Plan have been previously developed under the MOU, and approved by EPA and the MOU agencies. Therefore, the QAPP, HASP and CSM deliverables shall be revisions to existing documents.

The required OUs and associated RI/FS activities are listed below. Each OU and associated RI/FS activity shall have its own detailed schedule for implementation and deliverables, and an integrated schedule for all Site activities described in this SOW is provided in Section 15.0 of this SOW. The OUs and associated RI/FS activities are as follows:

- Site-wide Groundwater OU 1
- Pit Lake OU 2
- Process Areas OU 3
- Evaporation Ponds and Sulfide Tailings OU 4
- Waste Rock Areas OU 5
- Oxide Tailings OU 6
- Wabuska Drain OU 7
- Site-Wide Screening Level Ecological Risk Assessment (if needed)

Factors to be considered in developing the order of OUs and associated RI/FS activities include allowing for: 1) concern about potential human or ecological risk based on current site data; 2) addressing necessary and timely integration of investigations of contaminant sources and media such as contamination in the vadose zone migrating to associated groundwater; 3) potential re-development of portions of the mine site for industrial, commercial and/or recreational uses; 4) the amount of characterization data currently available from previous studies performed under the MOU (e.g., Process Areas); 5) ongoing characterization activities performed under Work Plans previously approved by EPA (e.g., air quality monitoring, implementation of the *Background Soils Work Plan* and the *Hydrogeologic Framework Assessment North of the Anaconda Yerington Mine Site*); 6) ongoing interim remedial actions (e.g., capping of sulfide tailings, improvements to the Arimetco fluid management system, removal of materials from the "radiological control area" located in the Process Areas of the Site; Anaconda evaporation ponds). Any site characterization data developed during the permitting, operation and closure of those portions of the site subject to re-mining and/or re-processing shall be made available to the Respondent to support the remedial investigations described in this SOW. The locations of the OUs are shown on Figure 1 - Operable Units.

Investigations associated with each OU will evaluate potential human health risks associated with the media pathways. Conducting the human health risk assessments on an OU-specific basis would allow EPA and the Respondent to develop remedial alternatives for specific site conditions that may vary between OUs, and provide the opportunity to advance re-use of selected portions of the Site within 10 days of the effective date of this UAO.

The investigations associated with each OU will require collection of analytical data to characterize contaminant sources, characterize and designate wastes, and evaluate the potential

for current and future sourcing of chemicals of potential concern ("COPCs") to the alluvial and bedrock groundwater flow systems associated with the Site. To implement this process in the most optimal manner, the Respondent will develop data quality objectives ("DQOs") for each OU-specific Work Plan. The DQOs will serve to guide the remedial investigations, feasibility studies and related activities for the OUs listed below.

1.3 RI/FS Requirements

Respondent shall perform all RI/FS activities according to the requirements described below.

1.3.1 Historical Research Requirements

Respondent shall conduct historical research for the OUs listed above to develop a conceptual understanding of the facility's operations, chemical uses, waste management, storage and disposal methods. In addition, potential contaminant migration pathways to and within the area of each OU shall be evaluated for site-specific conditions. Such information can be used to aid the investigation and should be used to determine the scope of investigation activities necessary to characterize the extent of contamination in various media and its relationship to surface and subsurface soils and within the facility infrastructure, buildings and subsurface structures, to determine potential applicable or relevant and appropriate regulations or requirements ("ARARs") for cleanup of contamination, and to propose a range of preliminary response alternatives in a Feasibility Study, should one be necessary. Respondent shall refer to EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA*, OSWER Directive 9355.3-01 (EPA OSWER, October 1988) ("EPA RI/FS Guidance") for a comprehensive list of data collection information sources.

1.3.2 Quality Assurance/Quality Control Requirements

Respondent shall use quality assurance and quality control ("QA/QC"), and chain of custody procedures for all RI/FS activities in accordance with *EPA Requirements for Quality Assurance Project Plans (QA/R5)* (EPA/240/B-01/003, March 2001), *A Guidance for Quality Assurance Project Plans (QA/G-5)* (EPA/600/R-98/018, February 1998), and subsequent amendments thereto upon notification by EPA to Respondent of such amendments. Respondent shall ensure that the laboratories utilized for the analysis of samples taken pursuant to this SOW perform all analyses according to accepted EPA methods and pursuant to the QAPP for quality assurance monitoring. Accepted EPA methods consist of those methods which are documented in *A Contract Lab Program Statement of Work for Inorganic Analysis*, ILM05.3 (February 2004), *A Contract Lab Program Statement of Work for Organic Analysis*, OLMO4.3 (August 2003), and *Multi-Agency Radiological Laboratory Analytical Protocols Manual*, NUREG-1576, EPA 402-B-004-001A,B,C, July 2004 ("MARLAP") and any amendments made thereto during the course of the implementation of this SOW. Respondent may use other analytical methods that are at least as stringent as the CLP-approved methods only after opportunity for review and comment by NDEP and BLM and approval by EPA.

Respondent shall ensure that all laboratories that are used for analysis of samples taken pursuant to this AOC participate in an EPA or EPA-equivalent QA/QC program. Respondent shall only use laboratories that have a documented Quality System that complies with *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*, ANSI/ASQC E4-1994 (American National Standard, January 5, 1995),

and *EPA Requirements for Quality Management Plans (QA/R-2)* (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the NELAP as meeting the Quality System requirements. Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this SOW are conducted in accordance with the procedures set forth in the EPA-approved QAPP. Work Plans to be developed under this SOW shall include an OU-specific Field Sampling and Analysis Plan ("FSAP") and QAPP amendment if required. The FSAP will be consistent with the updated QAPP and, as required, will address OU-specific modifications or updates or to the QAPP.

1.3.3 General Field Assessment Requirements

As appropriate for specific OUs and associated RI activities, Respondent shall address the following requirements in conjunction with the collection of samples for laboratory analysis:

- Geologic assessments to evaluate influence of geology on the potential release and movement of contaminants by evaluating regional geology in published reports, state geologic maps, U.S. Geological Survey topographic maps, previous site investigations and geophysical investigations. Where necessary, field mapping or verification of soils, overburden and bedrock outcrops shall be performed.
- For bedrock, determine the thickness and extent, lithology and mineralogy, structural features and discontinuities, or other characteristics that may be useful in assessing fate and transport of potential contaminants in the unsaturated or saturated zones.
- Determine areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition; and other characteristics affecting release. This shall include quantification of the following specific characteristics at each source area; 1) disposal or release area characteristics including: location and distribution of waste types, design features, operating practices, period of operation, age of area, and general physical conditions; 2) waste characteristics: type, quantity and chemical composition of wastes placed in the area, including degradation and reaction byproducts; physical and chemical characteristics of the waste; migration and dispersal characteristics of the waste including: sorption, biodegradability, hydrolysis rates and chemical transformations; biological effects of the waste on revegetation efforts and contaminant uptake potential. Data collection information shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis.
- Review historical records and data to assess historical operations, waste management and storage methods, and methods of disposal.
- Determination of soil characteristics in the unsaturated and saturated zones including, but not limited to, soil types, bulk density; porosity; soil pH, particle size distribution, moisture content, specific capacity, infiltration rate, and soil stratification. Soil classification will follow that of the U.S. Soil Conservation Service ("SCS").

- Determine vadose zone hydraulic characteristics including permeability, variability, porosity, holding capacity and moisture content. Determine hydraulic conductivity in the unsaturated zone and, as appropriate, assess unsaturated flow conditions. Evaluate engineering properties for potential capping, foundation uses, or other potential uses.
- Determine soil geochemical characteristics including, as applicable, temperature, biological activity and chemical processes (e.g., solubility, ion speciation, adsorption coefficients, release/attenuation functions, leachability, cation exchange capacity, mineral partition coefficients, and chemical and sorptive properties). Chemical characteristics will be used to evaluate the nature and extent of potential contaminant migration in the unsaturated and saturated zones. Determine, as applicable, similar bedrock geochemical characteristics.
- For sub-surface characterization activities, use test borings, test pits and trenches that will include logging and descriptions of subsurface geologic materials. Where applicable, use borehole geophysical methods to determine physical and chemical properties of soils.

1.3.4 Radiological Requirements

All Site-specific investigations shall conform to proper radiation investigation protocols outlined in the *Multi-Agency Radiation Survey and Site Investigation Manual* ("MARSSIM") EPA402-R-97-016/NUREG-1575. As appropriate for specific OUs, remedial investigations required in this SOW shall address the following radiological requirements:

- Perform radiometric surveys for surface exposure, in micro roentgens/hour, at one meter above ground level using hand-held survey meters sufficient to locate maximum gamma exposure rates. Determine background concentrations and localized sources of elevated radiometric readings and external radiation exposure rates. Identify any significant migration pathways, and determine any releases and potential offsite radiological contamination
- Assess specific occurrences of radionuclides including source locations, release points, distances to targets (measurements in activity units not mass units). For each radionuclide, determine atomic number and atomic weight, radioactive half-life, principal decay modes and radiation energies and abundances, chemical and physical forms, and decay products (decay products must be considered on a substance-specific basis). Determine the most likely chemical and physical form of each radionuclide at time of production, disposal, release and measurement.
- Determine identities and activity concentrations of radionuclides *in situ*. Estimate the possible extent of contamination including the depth of contamination by borehole gamma logging or other acceptable method (borehole gamma logging would extend to the bottom of any known radiological contamination plus at least one foot).

1.3.5 Baseline Human Health Risk Assessment Requirements

Baseline human health risk assessments ("HHRAs") will be completed during the RI/FS process to quantitatively describe the potential human health risk posed by the site in the absence of

remediation. Respondent shall submit a HHRA as an appendix to each RI report. Each baseline HHRA shall include an exposure assessment, toxicity assessment, and risk characterization. The baseline HHRAs for each OU shall be prepared in accordance with the following guidance documents:

- *Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual, Interim Final*, EPA-540-1-89-002 (Part A) (EPA OERR, December 1989);
- *A Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual, Interim, Publications 9285.7-01B and -01C (Part B, Development of Risk-based Preliminary Remediation Goals; Part C, Risk Evaluation of Remedial Alternatives)* (EPA OERR, December 1991);
- *Guidance for Data Usability in Risk Assessment*, EPA-540-G-90-008 (EPA, October 1990);
- *Exposure Factor Handbook*, EPA/600/P-95/002 (EPA 1997);
- *Guidance Manual for Integrated Uptake Biokinetic Model for Lead in Children*, EPA/540/R-93/081 (EPA 1994);
- *Revised Policy on Performance of Risk Assessments During Remedial Investigation/Feasibility Studies (RI/FS) Conducted by Potentially Responsible Parties*, OSWER Directive No. 9835.15c (EPA OSWER, January 1996);
- *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, OSWER Directive No. 9355.0-30 (EPA OSWER, April 22, 1991);
- *Integrated Risk Information System, IRIS, database available at <http://www.epa.gov/iris>* (EPA 2006);
- *Radionuclide Preliminary Remediation Goals for Superfund* OSWER Publication 9355.01-83A, (EPA 2002);
- *Radiation Risk Assessment at CERCLA Sites* OSWER Publication 9200.4-31P (EPA 1999); and
- *Paper On Tribal Issues Related To Tribal Traditional Lifeways, Risk Assessment, And Health & Well-Being: Documenting What We've Heard*, By Tribal Science Council.

Each baseline HHRA shall include a site-specific conceptual exposure model for the operable units being evaluated that illustrates the impacted media and all the exposure pathways; lists all contaminants of potential concern, standard exposure parameters and methodologies for determining human health risk. The baseline HHRAs shall be prepared based on information and data developed through the field investigations and data analysis for the OUs being investigated. The baseline HHRAs shall also include, but not be limited to, a discussion of the COPCs, exposure pathways of concern, the toxicity characteristics for potential COPCs, and the potentially impacted media. The baseline HHRAs shall include multiple descriptors of risk and supporting qualitative information to characterize health risks potentially associated with the operable units being evaluated. The baseline HHRAs shall include an exposure assessment, toxicity assessment, and a risk characterization.

Exposure Assessment

Respondent shall develop an exposure assessment that describes potentially exposed populations, identifies and evaluates exposure pathways from site-specific COPCs to exposed populations, estimates exposure concentrations at points of exposure, using environmental fate and transport modeling if needed, and estimates intake rates in humans from inhalation and ingestion exposure. In collaboration with EPA, Respondent shall develop exposure scenarios that are based upon land use assumptions for both current and possible future uses of the operable units being evaluated. The exposure scenarios shall define the sources of chemical release into the environment, identify potentially exposed populations, frequencies, and duration of potential exposure, and identify possible exposure pathways through which populations could come into contact with the released chemicals.

Respondent shall conduct bioavailability analysis of specific COPCs in soil if there is a need to reduce the uncertainty in risk estimates for those COPCs (i.e., if risk estimates are likely to be substantially overestimated due to use of default relative bioavailability assumptions). Such studies will be designed considering the *Draft Guidance for Evaluating Bioavailability of Metals in Soils for Use in Human Health Risk Assessment*, dated November 3, 2005, EPA, OSWER, 9285.7-80 and supporting technical document *Estimation of Relative Bioavailability of Lead in Soil and Soil-Like Materials Using in Vivo and In Vitro Methods*, EPA, OSWER, 9285.7-77). Results of any bioavailability analysis shall be provided as an appendix to the appropriate baseline HHRA for the relevant OUs.

Toxicity Assessment

Respondent shall develop baseline HHRA's that provide numerical indicators of chemical toxicity that will be used to characterize health risks and identify and select cancer risk slope factors and reference doses ("RfDs") or reference concentrations ("RfCs"). The recommended hierarchy for toxicity values described in *Human Health Toxicity Values in Superfund Risk Assessments* (Memorandum, OSWER 9285.7-53, December 2003) shall be used:

Tier 1 – IRIS. The preferred source of toxicity data is EPA's *Integrated Risk Information System (IRIS)* database.

Tier 2 – PPRTVs. If toxicity values for a contaminant of potential concern are not available in IRIS, the next source to consult is EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs). This source includes toxicity values that have been developed by the Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center (STSC). This database is not available to the general public, but is accessible to EPA risk assessors via EPA's intranet at <http://hhpprtv.ornl.gov/>.

Tier 3 - Other Toxicity Values. Tier 3 includes additional EPA and non-EPA sources of toxicity information, including:

- The California EPA (Cal/EPA)'s *Toxicity Criteria Database*
- The Agency for Toxic Substances and Disease Registry (ATSDR)'s *Minimal Risk Levels*

(MRLs) for Hazardous Substances

- Toxicity values in EPA's Health Effects Assessment Summary Tables (HEAST) (EPA-540-R-97-036; July 1997) are also Tier 3 values. The HEAST values on chemical contaminants are not currently available on an EPA internet site. They may be obtained by contacting a Superfund risk assessor.

Toxicity values for radionuclides shall be the radionuclide slope factors contained in the HEAST Radionuclides Table (formerly Table 4) from EPA's Office of Radiation and Indoor Air (ORIA). These radionuclide slope factors have been adopted by EPA in its Preliminary Remediation Goals for Radionuclides calculator and the Soil Screening Guidance for Radionuclides documents.

Risk Characterization

For each HHRA, Respondent shall develop a characterization of health risks combining the results of the toxicity assessment and exposure assessment to provide numerical estimates of health risk. The health risk estimates shall compare exposure levels with appropriate RfDs or estimates of the lifetime cancer risk associated with a particular chemical intake rate. The risk characterization shall present multiple descriptors of risk and supporting qualitative information to characterize potential health risks associated with the facility. Two risk descriptors shall be presented in the risk assessment: 1) Central Tendency Risk (average or median risk); and 2) the Reasonable Maximum Exposure. The risk characterization shall include summary tables of the results. Respondent shall address the nature and weight of evidence supporting the risk estimates and the magnitude of uncertainty surrounding the estimates.

Baseline Human Health Risk Assessment Reports

For each RI/FS, Respondent shall submit a draft *Baseline Human Health Risk Assessment Report* that includes the Exposure Assessment, Toxicity Assessment, and Risk Characterization included as an appendix to the draft *Remedial Investigation Report* for each OU and, as appropriate, associated RI/FS activity. Respondent shall submit a Final Baseline Human Health Risk Assessment as a part of the Final Remedial Investigation Report prepared for each OU.

1.3.6 Remedial Alternative Requirements

Respondent shall identify preliminary remedial action objectives ("RAOs"), remedial action alternatives and associated technologies for each known or potentially contaminated medium. The range of potential alternatives shall encompass, where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste, alternatives that involve containment with little or no treatment, and a no-action alternative. Feasibility studies shall be conducted in accordance with EPA's *Guide to Selecting Superfund Remedial Actions* EPA OSWER 9355.0-27FS and *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*, EPA OSWER 9355.3-01, October 1988.

A Remedial Alternatives Screening Summary shall be prepared for each OU that identifies and describes potential treatment technologies. The Remedial Alternatives Screening Summary shall consider whether the identified remedial alternative will reduce the toxicity, mobility, or volume of wastes, and whether each remedial alternative will use treatment, containment and off-site disposal exclusively, or a combination of the components, and a no-action alternative. For each

alternative, Respondent shall present both engineering components and non-engineering, institutional controls to be considered should the alternative leave waste in place above Site-specific Performance Levels during and/or after remedial action has been taken. As described in the EPA RI/FS Guidance, the Remedial Alternatives Screening Summary shall describe how remedial alternatives have been screened according to effectiveness, implementability, and cost to determine whether an alternative should undergo a more thorough and extensive analysis. The Remedial Alternatives Screening Summary shall identify all treatability studies that have been or will be conducted to support any remedial alternatives.

Respondent shall identify remedial action alternatives that will protect human health and the environment by eliminating, reducing, or otherwise controlling any risks posed through each exposure pathway and migration route. The number and type of alternatives to be evaluated shall take into account the characteristics and complexity of the OU or associated RI activity. A phased approach for evaluation of alternatives may be required for selected OUs including an initial screening of alternatives to reduce the number of potential remedies for the final detailed evaluation.

The final evaluation of remedial action alternatives that pass an initial screening shall be evaluated for compliance with the requirements in (40 CFR 300.430[e][9]). Specifically, each alternative must be assessed for:

- Overall protection of human health and the environment;
- Compliance with all applicable or relevant and appropriate federal, state and tribal laws and regulations;
- Long term effectiveness and permanence;
- Reduction of the toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and
- Community acceptance.

The evaluation of remedial alternatives, based on the nine criteria specified above, shall result in the recommendation of a preferred remedial action plan and schedule for each of the OUs for EPA approval.

1.3.7 Additional Requirements

Additional requirements of this SOW include:

- All RI/FS Work Plans shall be based on Appendix B of *EPA RI/FS Guidance*, which provides a comprehensive description of Work Plan format and contents.
- Should EPA make a written determination that a specific treatment technology may facilitate remediation, any treatability studies shall be conducted in accordance with EPA's *Guide For Conducting Treatability Studies Under CERCLA* EPA 540/R-92/071A.

1.4 RI/FS Tasks

Five major tasks shall be implemented for the remedial investigation of each OU, according to the general schedule provided in Section 1.5 of this SOW (an additional treatability study task, as described in Section 1.4.3, may also be required for certain OUs, as appropriate):

- Preparation and implementation of a *Remedial Investigation Work Plan*;
- Assessment of the human health risks associated with each OU, resulting in the completion of a *Baseline Human Health Risk Assessment* developed in accordance with Section 1.3.5 of this SOW;
- Preparation of a *Remedial Investigation Report*;
- Characterize ecological risks associated with each OU to determine whether remediation is necessary to mitigate significant risks to ecological receptors; and
- Preparation of a *Feasibility Study*.

1.4.1 Preparation and Implementation of a Remedial Investigation Work Plan

Respondent shall provide an overview and historical information regarding each OU and submit a *Remedial Investigation Work Plan* for each OU in accordance with Appendix B of *EPA RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation, and the investigation schedule. Sections 7.0 through 13.0 of this SOW describe specific components of, and requirements for, Work Plans for each OU. Work Plans shall identify the project team, describe investigation strategies and methods, provide a project management plan, provide a FSAP, reference the QAPP, HASP, CSM and DMP components described in Sections 2.0 through 5.0 of this SOW, and summarize all pertinent information necessary to characterize the vertical and lateral extent of potential contamination. A detailed description of activities necessary to conduct a baseline HHRA for each OU shall also be included in each *Remedial Investigation Work Plan*.

1.4.2 Preparation and Implementation of a Baseline Human Health Risk Assessment

The baseline HHRA shall be attached to each *Remedial Investigation Report* for each OU, and shall address all media areas, exposure pathways, contaminants, and health risks according to the guidance and approach described in Section 1.3.5 of this SOW. The baseline HHRA shall include an "Exposure Assessment" that describes potentially exposed populations, identifies and evaluates exposure pathways from Site-specific COPCs to exposed populations, estimates exposure concentrations at points of exposure using environmental fate and transport modeling, and estimates intake rates in humans from inhalation and ingestion exposure. In addition, Respondent shall develop a Toxicity Assessment and Risk Characterization that are consistent with the guidance and requirements provided in Section 1.3.5 of this SOW.

1.4.3 Preparation and Implementation of a Treatability Study (if required)

Should EPA make a written determination that specific treatment technologies may facilitate the remediation of a specific OU, Respondent shall submit a draft *Treatability Study Work Plan* and proposed schedule for EPA review and approval in a manner consistent with the guidance and requirements previously provided in Task 1.3.5 of this SOW.

1.4.4 Preparation and Implementation of a Remedial Investigation Report

Respondent shall submit a draft *Remedial Investigation Report* for each OU for EPA review that includes, but is not limited to: a description of the nature and extent of contamination, and physical and chemical properties of the OU, facility structures, investigation objectives, a description of the field investigations undertaken to meet the identified objectives, and an updated CSM. The *Remedial Investigation Report* shall include a summary of all the data results, including original analytical reports, recommendations for additional phases of investigation where all the data gaps are not filled, and preliminary RAOs and ARARs for the remediation of the OU.

Respondent shall identify preliminary RAOs and potential remedial action alternatives and associated technologies for each known or potentially contaminated medium. The range of potential alternatives shall encompass, where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the OU materials, alternatives that involve containment with little or no treatment, and a no-action alternative. The remedy shall attain the ARARs identified in the Feasibility Study, or identify appropriate waivers of such ARARs. Respondents shall identify any potential new ARARs or proposed changes to existing ARARs that pertain to any remedial alternative being analyzed in the *Feasibility Study Report*.

The *Remedial Investigation Report* for the OU shall also present the results of any treatability studies conducted as part of the RI, including a description of the objectives, the parameters used to evaluate the success of the study, results and the conclusions of the treatability study. The *Remedial Investigation Report* for the OU shall also contain the *Baseline Human Health Risk Assessment*.

Should EPA make a written determination that additional data are required to determine the full extent of contamination for a specific OU, Respondent shall amend the *Remedial Investigation Work Plan* ("*Remedial Investigation Work Plan Amendment*") within 45 days to reflect the tasks necessary to gather the additional data. The *Remedial Investigation Work Plan Amendment* shall describe the objectives of additional investigations, DQOs, overview of the investigation strategy, description of the tasks associated with performing the investigation, and a schedule for performing the investigation. In addition, Respondent shall amend the FSAP, QAPP, and HASP, as necessary, to address any additional investigations. Following completion of tasks required by the *Remedial Investigation Work Plan Amendment*, Respondent shall incorporate that data into a draft *Remedial Investigation Report Amendment* that summarizes the purpose and results of the additional investigations.

1.4.5 Screening Level Ecological Risk Assessment

Within ninety (90) days after finalization of the Remedial Investigation Reports for the various Operable Units, EPA will make a determination of whether a Screening Level Ecological Risk Assessment (SLERA) is needed and that Respondent shall conduct a SLERA for the OU according to the guidance and approach called out in Section 14.0 of this SOW. The SLERA will determine whether Site-related contaminants pose a current or potential risk to the environment in the absence of any remedial action. Respondents shall address the contaminant identification, exposure assessment, toxicity assessment, and risk characterization. The SLERA will be used to determine whether remediation is necessary at the Site to mitigate significant

risks to ecological receptors, provide justification for performing remedial action, and determine which exposure pathways need to be remediated.

1.4.6 Preparation and Implementation of a Feasibility Study

Respondent shall submit for EPA review and approval a *Remedial Alternatives Screening Summary* after EPA's determination for the need of a Feasibility Study for a specific OU. The *Remedial Alternatives Screening Summary* shall be consistent with the guidance and requirements in Section 1.3.6 of this SOW. Upon EPA approval of the *Remedial Alternatives Screening Summary*, Respondent shall submit a draft *Feasibility Study Report*. The draft *Feasibility Study Report* shall document the development and analysis of remedial alternatives and provide a basis for any recommended remedy for groundwater, soil or other appropriate media remedy. Upon receipt of EPA comments on the draft *Feasibility Study Report*, Respondent shall submit to EPA for review and approval a final *Feasibility Study Report*.

1.5 RI/FS Implementation Schedules

Table 1 presents a generic implementation schedule for an individual OU and associated RI activity at the Site. The schedule shown in Table 1 includes the need for a treatability study. However, not all OUs or RI activities will require a treatability study, and the anticipated schedule would, accordingly, be reduced by approximately 120 days for each OU that does not require a treatability study. Each of the implementation schedules provided in Table 2 for individual OUs would be subject to the nominal time frames presented in Table 1 (i.e., the Work Plan schedules for each OU listed in Table 2 will require the duration presented in Table 1).

Table 1. Work Plan Development and Implementation Schedule for Operable Units (through submittal of Final Feasibility Study; includes Treatability Study)	
Activity/Deliverable	Days Since Start of Work Plan Preparation ¹
Preparation and submittal of Draft Work Plan with FSAP and QAPP Amendment	See OU-specific number of days after effective date of AOC
Preparation and submittal of Final Work Plan with FSAP and QAPP Amendment	30 days after receipt of EPA comments
Initiate Field Investigation Activities ²	30 days after EPA Approval of Final Work Plan with FSAP and QAPP Amendment
Prepare and submit Draft RI Report (includes statistical comparison to Region 9 PRGs and background soils, and draft Baseline Human Health Risk Assessment Report) ³	120 days after notification of completion of Field Investigation Activities (defined as collection of last sample)
Preparation and submittal of Final RI Report with baseline HHRA	30 days after receipt of EPA comments
Prepare and submit Draft Treatability Study	60 days after EPA written determination treatability study needed
Prepare and submit Final Treatability Study	30 days after receipt of EPA comments
Prepare and submit Draft Remedial Alternatives Screening Summary	60 days after EPA written determination that feasibility study is necessary
Prepare and submit Final Remedial Alternatives Screening Summary	30 days after receipt of EPA comments

Prepare and submit Draft Feasibility Study	90 days after EPA approval of Final Remedial Alternatives Screening Summary
Prepare and submit Feasibility Study	30 days after receipt of EPA comments

Notes: 1. All submittal durations may be extended if justification is provided in writing and approved by EPA.
2. Initiation of field investigation activities defined as written notification of initiation of logistical support activities such as contracting or access negotiations.
3. The time required to complete field characterization or other RI activities (X days) could range from 60 to 180 days or more, pending EPA requirements, and does not include longer-term monitoring. The duration of the baseline human health risk assessment process is assumed to range from 90 to 180 days.

Table 2. Integrated RI/FS Implementation Schedule

Activity/Deliverable	Days After Effective Date of AOC
Draft Site-Wide QAPP	30 days
Draft Site-Wide HASP	45 days
Draft Site-Wide DMP	75 days
Draft Site-Wide CSM	90 days
Draft Site-Wide Groundwater Monitoring Plan	180 days
Draft Site-Wide Groundwater OU 1 Work Plan	90 days
Draft Pit Lake OU 2 Work Plan	270 days
Draft Process Areas OU 3 Work Plan	120 days
Draft Evap. Ponds and Sulfide Tailings OU 4 Work Plan	Based on receipt of Process Areas OU RI analytical data – estimated at 578 days
Draft Waste Rock Areas OU 5 Work Plan	Based on receipt of Process Areas OU RI analytical data – estimated at 578 days
Draft Oxide Tailings OU 6 Work Plan	Based on receipt of Waste Rock Areas OU RI analytical data – estimated at 1034 days
Draft Wabuska Drain OU 7 Work Plan	Based on receipt of Waste Rock Areas OU RI analytical data – estimated at 1034 days
Draft Site-Wide Ecological Risk Assessment (if necessary)	To be determined

Some variation to the schedules should be anticipated based on the degree of complexity of the OU or associated RI activity. For example, selected RI activities would be phased with the submittal of one or more Work Plan addenda, resulting in the potential for more prolonged schedules. In addition, some OUs and associated RI activities will likely require the installation of monitoring equipment, which could add to the duration of each specific schedule. Section 15.0 of this SOW presents an integrated schedule for all the OUs and associated RI/FS activities (Site-wide groundwater monitoring and Site-wide screening level ecological risk assessment).

SECTION 2.0 SITE-WIDE QUALITY ASSURANCE PROJECT PLAN

The EPA-approved Site-wide QAPP shall be revised and incorporated into the different OU and

associated RI Work Plans either by reference or as an amendment to address the range of anticipated activities described in the Work Plans and to reflect radiological sampling (the November 2004 *Radiological and Chemical Exposure Plan* and *Multi-Agency Radiation Survey and Site Investigation Manual "MARSSIM"* (EPA402-R-97-016/NUREG-1575) should be evaluated to assess if any changes are needed). Respondent shall use quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance and monitoring samples in accordance with *EPA Requirements for Quality Assurance Project Plans (QA/R5)* (EPA/240/B-01/003, March 2001), *A Guidance for Quality Assurance Project Plans (QA/G-5)* (EPA/600/R-98/018, February 1998), and subsequent amendments thereto upon notification by EPA to Respondent of such amendments.

Respondent shall ensure that the laboratories utilized for the analysis of samples taken pursuant to this SOW perform all analyses according to accepted EPA methods and pursuant to the QAPP for quality assurance monitoring. Accepted EPA methods consist of those methods which are documented in *A Contract Lab Program Statement of Work for Inorganic Analysis*, ILM05.3 (February 2004) and *A Contract Lab Program Statement of Work for Organic Analysis*, OLMO4.3 (August 2003), and *Multi-Agency Radiological Laboratory Analytical Protocols Manual*, NUREG-1576, EPA 402-B-004-001A,B,C, July 2004 ("MARLAP") and any amendments made thereto during the course of the implementation of this SOW. Respondent may use other analytical methods that are at least as stringent as the CLP-approved methods only after opportunity for review and comment by NDEP and BLM and approval by EPA.

Respondent shall ensure that all laboratories that are used for analysis of samples taken pursuant to this AOC participate in an EPA or EPA-equivalent QA/QC program. Respondent shall only use laboratories that have a documented Quality System that complies with Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs, ANSI/ASQC E4-1994 (American National Standard, January 5, 1995), and *EPA Requirements for Quality Management Plans (QA/R-2)* (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the NELAP as meeting the Quality System requirements.

Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this SOW are conducted in accordance with the procedures set forth in the EPA-approved QAPP. The deliverable schedule for the QAPP s provided below:

Deliverable	Due Date
Draft Site-Wide QAPP	30 days after effective date of AOC
Final Site-Wide QAPP	30 days after receipt of EPA comments

SECTION 3.0 SITE-WIDE HEALTH AND SAFETY PLAN

Respondents shall evaluate for potential revision, if needed and submit, to EPA an updated site-wide HASP for all field investigation activities that conforms to the applicable OSHA standards and EPA requirements, including but not limited to 29 C.F.R. ' 1910.120. The deliverable

schedule for the HASP is provided below:

Deliverable	Due Date
Draft Site-Wide HASP	45 days after effective date of AOC
Final Site-Wide HASP	30 days after receipt of EPA comments

SECTION 4.0 SITE-WIDE DATA MANAGEMENT PLAN

Respondent shall prepare a Site-wide DMP to establish the framework for consistent documentation of the quality and validity of field and laboratory data compiled during all investigations required by this SOW according to the procedures described under this task. The DMP shall describe in detail the data management procedures for all Site-related data including groundwater, soil, soil gas, air, and any other Site-specific data collected as part of this SOW. The DMP shall also describe how this new data will be integrated and comprehensively managed with previously collected and historical data. The DMP shall include procedures and time lines for sharing data with EPA and other stakeholders, including procedures for providing both electronic and hard copies, including a list of recipients of each type of data.

Respondent shall ensure that all information gathered as part of the investigations described in the SOW shall be consistently documented and adequately recorded in well-maintained field logs and laboratory reports. The method(s) of documentation shall be specified in the Work Plans for each of the investigations described in this SOW. Field logs shall be used to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports shall document sample custody, analytical responsibility, analytical results; adherence to prescribed protocols, nonconformity events, corrective measures, and data deficiencies. EPA may request copies of each of these documents at any time during performance of the Work described in this SOW. Ultimately, copies of each of these documents shall be compiled and submitted to EPA as appendices to reports required by this SOW.

Respondent shall maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and used in the development and evaluation of remedial alternatives. Analytical results developed under the SOW will not be included in any investigation reports unless accompanied by or cross-referenced to the corresponding QA/QC report.

In addition, Respondent shall establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

Respondent shall provide data to EPA in an electronic format compatible with EPA data management systems. Respondent shall maintain any data collected as part of this SOW in an electronic database that will comply with the most recent EPA Data Submittal Guidance Document, and any additional requirements deemed necessary by EPA. The deliverable schedule for the DMP is provided below:

Deliverable	Due Date
Draft Site-Wide DMP	75 days after effective date of AOC
Final Site-Wide DMP	30 days after receipt of EPA comments

SECTION 5.0 CONCEPTUAL SITE MODEL

Respondent shall update the EPA-approved October 2002 CSM to reflect all pertinent historical information and Site data collected since 2002. The CSM shall conform to applicable EPA requirements, including *Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA, EPA 540/G-89/004, OSWER 9355.3-01*. The CSM shall include known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migration, and known and potential human or environmental receptors. Development of data quality objectives ("DQOs") for the specific Work Plans to be developed under this SOW will, in part, be based on the sources, pathways and potential receptors described in the CSM. The deliverable schedule for the CSM is provided below:

Deliverable	Due Date
Draft Site-Wide CSM	90 days after effective date of AOC
Final Site Wide CSM	30 days after receipt of EPA comments

SECTION 6.0 SITE-WIDE GROUNDWATER MONITORING PLAN

In addition to the RI/FS tasks for each OU described below, Respondent shall continue current groundwater monitoring activities established in conjunction with the operation and maintenance of the Pumpback Well System (constructed under the State of Nevada Administrative Order on Consent to Anaconda Minerals dated October 1, 1985) while establishing an updated *Site-Wide Groundwater Monitoring Plan*. Respondent shall conduct periodic (annual, semi-annual, quarterly, monthly and/or weekly, as specified in the annual Groundwater Monitoring Plan) monitoring of all wells, with greater monitoring frequency for threatened and previously contaminated wells and for drinking water supply wells.

Respondent shall establish and implement an updated comprehensive *Site-Wide Groundwater Monitoring Plan* to include, but not be limited to, an updated inventory of all wells both on site and off site in the vicinity of the Site, identification of the wells to be sampled, the rationale and frequency for sampling each well, the COPCs to be analyzed for in each well, the analytical methods to be used, the sampling procedures to be followed, and the O&M procedures to be followed for the monitor well network. For the existing and enhanced programs, Respondent shall continue to provide an annual update to the *Site-Wide Groundwater Monitoring Plan*.

The *Site-Wide Groundwater Monitoring Plan* shall incorporate EPA comments provided to Respondent on July 15, 2005 on the draft *Interim Operations and Maintenance Plan, Pumpback Well System and Arimetco Heap Leach Water Management, Yerington Mine Site* dated June 1,

2005. The *Site-Wide Groundwater Monitoring Plan* shall include, but not be limited to, an updated inventory of all wells both on site and off-site in the Site vicinity, identification of the wells to be sampled, the rationale and frequency for sampling each well, the COPCs to be analyzed for in each well, the analytical methods to be used, the sampling procedures to be followed, and the O&M procedures to be followed for the groundwater monitoring well network. Respondent shall update the *Site-Wide Groundwater Monitoring Plan* annually to reflect any new data collected during the prior year, provide a summary evaluation of groundwater trends, and document EPA-approved modifications to the monitoring program for the next year that were presented in the *Annual Site-Wide Groundwater Monitoring Report*. The *Site-Wide Groundwater Monitoring Plan* shall incorporate elements of the updated QAPP and HASP and, as necessary, include specific FASP elements not addressed in the updated QAPP. The deliverable schedule for the *Site-Wide Groundwater Monitoring Plan* is provided below:

Deliverable	Due Date
Draft Site-Wide Groundwater Monitoring Plan	180 days after effective date of AOC
Final Site Wide Groundwater Monitoring Plan	30 days after receipt of EPA comments

As part of the *Site-Wide Groundwater Monitoring Plan*, Respondent shall provide quarterly and annual reporting for all components of the Pumpback Well System. In addition, Respondent shall continue monthly reporting via electronic mail ("Monthly Status") and in hard copy. Respondent shall provide immediate notice to EPA upon discovery of a significant increase of Site COPCs. Should concentrations of any Site-related COPC in any well indicate a significant increase, defined as equaling or exceeding twice the concentration from the previous sampling event, Respondent shall inform the EPA Remedial Project Manager by telephone within twenty-four (24) hours of the discovery of the increase (receipt of analytical report from laboratory), followed by written confirmation within five (5) days.

Quarterly *Site-Wide Groundwater Monitoring Reports* shall include a description of monitoring activity conducted during the previous quarter, a chronological data summary of water level measurements and water quality analyses for all monitor wells (including wells periodically or no longer sampled), discussion of the distribution of COPCs in the groundwater underlying the site, discussion of any QA/QC issues that arose in the previous quarter, and an assessment of plume capture. Respondents shall address all of EPA comments on any quarterly report in the following quarterly report.

Annual *Site-Wide Groundwater Monitoring Reports* shall include all elements required for the *Quarterly Site-Wide Groundwater Monitoring Reports* and also shall include the following: a description of the scope and objectives of the monitoring program, a summary of historical Site-related groundwater investigation and monitoring activities, total volume of groundwater extracted and total mass of contaminants removed, a description of any groundwater investigation activities conducted that year, identification of any new COPCs or changes in COPC distribution, and any recommendations for changes, or additions or deletions to the monitor and extraction well network, including recommendations for changes to the monitoring frequency for specific wells. Schedules for quarterly and annual *Site-Wide Groundwater*

Monitoring Reports shall be established upon the implementation of this task.

SECTION 7.0 SITE-WIDE GROUNDWATER OPERABLE UNIT

The purpose of the Site-Wide Groundwater and Monitoring ("Groundwater") Remedial Investigation is to characterize and monitor the groundwater in the vicinity of the Site (study area to be determined), including on- and off-Site locations. The Groundwater RI underlies all other OUs identified in this SOW, and elements of the other OUs may be integrated with this Groundwater OU or *vice versa*. In particular the Groundwater RI will need to be integrated with the assessment of groundwater conditions associated with the Pit Lake OU described in Section 8.0 of this SOW. The Groundwater RI activities also include assessing potential human health risk and ecological risk, if groundwater to surface water pathways exist, and identifying areas that may require remediation. Adequate data collection to satisfy the DQOs for this RI shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The physical and chemical characteristics of groundwater;
- The physical and chemical characteristics of the alluvial groundwater flow systems outside of the capture zone of the pit lake;
- The history, design features, operating practices and period of operation of Site facilities that may have impacted groundwater quality;
- The history, design features, operating practices and period of operation of the Pumpback well System; and
- Long-term monitoring of groundwater conditions.

Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding, dated March 28, 2002, should be reviewed and considered in the preparation of the Work Plans and reports to be submitted for this OU. The documents specific to this task include the *Draft Final Groundwater Conditions Work Plan* dated February 25, 2005, *Draft Yerington Pit Lake Work Plan* dated January 30, 2003, 2002, *Annual Monitoring and Operation Summary Pumpback Well System, Yerington, Nevada* dated July 2003, *Yerington Mine Pumpback Well System 2003 Operations and Monitoring Summary* dated August 2004, *Yerington Mine Pumpback Well System 2004 Operations and Monitoring Summary* dated March 2005, and the *Interim Data Summary Report, Hydrogeologic Framework Assessment* dated June 2, 2006. Additional documents containing pertinent information which should be consulted are the *Final Radiological Monitoring Report October 2004 – April 2005, Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

The planned Site-Wide Groundwater OU RI activities shall build on the work completed to date through the Hydrogeologic Framework Assessment, which is essentially equivalent to Phase 1 of the Site-Wide Groundwater RI. The upcoming Step 2 of the Hydrogeologic Framework

Assessment will provide further data to directly support the Site-Wide Groundwater OU RI.

The *Groundwater Remedial Investigation Work Plan* shall provide an overview of the investigation strategy, a description of the tasks associated with performing the investigation, including any treatability studies, and an investigation schedule. The *Groundwater Remedial Investigation Work Plan* shall identify the project team, describe investigation methodologies, describe information necessary to characterize the pit lake and associated groundwater flow systems, describe other data requirements to support any investigation methods used, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, provide the investigation schedule, and describe the DQOs for the investigation. A detailed description of activities necessary to conduct a baseline human health risk assessment for the groundwater OU shall also be included in the *Groundwater Remedial Investigation Work Plan*, which will be developed in accordance with Appendix B of *EPA RI/FS Guidance*. The *Groundwater Remedial Investigation Work Plan* shall include, but not be limited to, the following:

- Specific hydrogeologic characteristics of the bedrock and alluvial groundwater flow systems in the study area including regional and local topography, geology, stratigraphy, structural geology and depositional history;
- A description of anthropogenic influences that may affect the hydrogeology in the vicinity of the Site including agricultural irrigation areas, drains, ditches, conveyance altered channels, seals or compacted fill;
- Identification and characterization of areas and amounts of recharge and discharge, regional and local groundwater flow patterns, characterization of seasonal variations in the groundwater flow regime;
- Collection of general meteorological data including, as applicable, daily precipitation and temperature records, annual and monthly precipitation averages, monthly temperature averages, wind speed and direction, evaporation rates, and climatic extremes (including frequency of occurrence);
- An analysis of topographic features that might influence the groundwater flow system including watershed characteristics;
- Assessment of hydraulic relationships between the Groundwater and surface water flows, including the Walker River, and a water balance/budget and estimate of steady-state hydrologic conditions;
- The installation of exploratory boreholes, groundwater elevation measurements, water quality sampling, installation and calibration of monitoring equipment;
- Based on field data, and cores, classification and description of the saturated and unsaturated hydrogeologic units which may be part of the migration pathways including, as appropriate, hydraulic conductivity, porosity, effective porosity, pore water and Darcy velocity; lithology, grain size, sorting, degree of cementation, and an interpretation of the

degree of interconnections between saturated zones

- Based on field data and cores, assess structural geologic elements and construct hydrogeologic cross sections and fence diagrams showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways;
- Identify, as appropriate, sand and gravel layers in unconsolidated deposits, zones of fracturing or channeling in consolidated or unconsolidated deposits, zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants, geologic formations or group of formations that are capable of yielding a significant amount of groundwater to wells and springs, and water bearing zones that may serve as a pathway for contaminant migration including perched zones of saturation;
- Based on data obtained from groundwater monitoring wells and/or piezometers, installed up-gradient and down-gradient from the potential contaminant sources, define groundwater elevations using water level contours and/or potentiometric maps (legibly displayed on appropriate scale maps), hydrologic cross sections showing vertical gradients, flow systems including the vertical and horizontal components of groundwater flow, and seasonal or temporal changes in groundwater elevations or hydraulic gradients;
- Definition of aquifer properties (e.g., hydraulic conductivity, transmissivity, storativity) by a program of aquifer testing to measure the hydraulic connection between areas and throughout the known extent of contamination;
- Definition of contaminant pathways from the Anaconda and Arimetco facilities to all aquifers including boundary conditions, character of water-bearing units, presence or absence of impermeable units or confining layers,
- Groundwater quality data including pH, total dissolved solids, salinity, specific conductance, concentrations of selected metals and radiochemicals, and a comparison of such data to background concentrations;
- As related to other OUs, collect groundwater quality data at to-be-determined locations underlying the tailings, evaporation ponds, portions Process Areas, heap leach pads and other potential sources of contamination; and
- Continuation and enhancement (i.e., additional wells) of the existing groundwater monitoring program.
- The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

Field support activities include, but not limited to, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field

activities, analytical results will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP.

The description of all field activities and a summary of analytical results shall be presented in a *Groundwater Remedial Investigation Report*, which will: 1) describe well locations, sampling locations and depths, aquifer test plans and groundwater modeling plans; 2) identify all potential sources of groundwater contamination and contaminant migration pathways (including pathways from groundwater to surface water); 3) define all plumes and evaluate the horizontal and vertical and lateral extent of groundwater contamination, direction and velocity of contaminant movement; 4) define the horizontal and vertical concentration of indicator parameters for potential groundwater contamination; evaluate other factors affecting contaminant transport; and 5) extrapolate the future contaminant transport using a comprehensive combined groundwater flow and fate-and-transport model, including the colloidal transport of radionuclides in groundwater.

As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 8.0 PIT LAKE OPERABLE UNIT

The purpose of the remedial investigation of the Pit Lake OU of this SOW is to characterize existing and future surface water conditions in the Pit Lake and groundwater conditions in the bedrock and alluvial flow systems in the immediate vicinity of the Pit Lake. In addition, the *Pit Lake Remedial Investigation Work Plan* shall identify short-term and long-term monitoring requirements for this OU. This OU is specifically related to that geographic portion of the associated RI activity described under Section 7.0 of this SOW (Site-Wide Groundwater OU). The activities in this section of the SOW also include assessing potential human health and ecological risk, and identifying portions of the Pit Lake OU that may require remediation. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The physical and chemical characteristics of the pit lake on a depth-specific and seasonal basis;
- The physical and chemical characteristics of the bedrock and alluvial groundwater flow systems within the capture zone of the pit lake;
- The history, design features, operating practices and period of operation of the open pit;
- Potential biological effects of the pit lake and contaminant uptake potential on both human and ecological receptors.

Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding dated March 28, 2002, should be reviewed and considered in the preparation of

the Work Plans and reports to be submitted for this OU. The documents specific to this task that should be considered include the *Draft Final Groundwater Conditions Work Plan* dated February 25, 2005 and *Draft Yerington Pit Lake Work Plan* dated January 30, 2003, and *Hydrogeologic Framework Assessment North of the Anaconda Yerington Mine Site* dated April 22, 2005. Additional documents containing pertinent information which should be consulted are the *Final Radiological Monitoring Report October 2004 – April 2005*, *Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

The *Pit Lake Remedial Investigation Work Plan* shall provide an overview of the investigation strategy, a description of the tasks associated with performing the investigation, including any treatability studies, and an investigation schedule. The *Pit Lake Remedial Investigation Work Plan* shall identify the project team, describe investigation methodologies, describe information necessary to characterize the pit lake and associated groundwater flow systems, describe other data requirements to support any investigation methods used, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, provide the investigation schedule, and describe the DQOs for the investigation. A detailed description of activities necessary to conduct a baseline human health risk assessment and screening level ecological risk assessment for the Pit Lake OU shall also be included in the *Pit Lake Remedial Investigation Work Plan*, which will be developed in accordance with Appendix B of *EPA RI/FS Guidance*.

The *Pit Lake Remedial Investigation Work Plan* shall include, but not be limited to, the following:

- Specific hydrogeologic characteristics of the bedrock and alluvial groundwater flow systems within the capture zone of the Pit Lake;
- A description of regional and local geologic and hydrogeologic conditions affecting groundwater flow including stratigraphy, structural geology and depositional history;
- Identification and characterization of areas and amounts of recharge and discharge, regional and local groundwater flow patterns and characterization of seasonal variations in the groundwater flow regime;
- Collection of general meteorological data including, as applicable, daily precipitation and temperature records, annual and monthly precipitation averages, monthly temperature averages, wind speed and direction, evaporation rates, and climatic extremes;
- An analysis of topographic features that might influence the groundwater flow system including specific watershed characteristics;
- Structural features on pit highwalls including physical conditions and stability;
- Surface water flow rates from highwall springs and seeps, and an evaluation of the effect of highwall springs and seeps in surface water recharge to the Pit Lake;

- Pit Lake water quality including limnological data (seasonal stratification/mixing), measurements of DO, conductivity, pH, temperature, flow rate, TDS, TSS, suspended sediment, sulfate, chloride, nitrate, total and dissolved metals and radiochemicals; and
- Assessment of hydraulic relationships between the Pit Lake, groundwater and surface water flows in the Walker River including the development of a water balance/budget and estimate of steady-state hydrologic conditions, and determination if the Pit Lake is or will be a flow-through system or evaporative sink.
- The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Pit Lake Remedial Investigation Work Plan* shall also include, but not be limited to, development and implementation of ecological field surveys, installation of exploratory boreholes and monitoring wells, water quality sampling, installation and calibration of monitoring equipment, completion of treatability studies and other field tests and data analysis. Field support activities include, but are not be limited to scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Analytical results will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP. Field activities and a summary of analytical results will be presented in a *Pit Lake Remedial Investigation Report*.

As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 9.0 PROCESS AREAS OPERABLE UNIT

The Process Areas OU has been the subject of soil sample collection and analyses, and characterization of underlying groundwater conditions. In the long term, the Process Areas may be re-developed for industrial or commercial uses. The Process Areas OU is located within the center of the Site and is intermingled with, and adjacent to, other OUs. In light of that fact, the Process Areas OU RI activities will be conducted, where feasible, in conjunction with those activities related to the investigation for other OUs (e.g., Arimetco Facilities to be handled separately by EPA, Evaporation Ponds and Sulfide Tailings OU and Oxide Tailings OU as shown in Figure 1-1).

The planned Process Areas OU RI activities shall build on the work completed to date through the Process Areas data summaries reports for soils characterization and groundwater conditions, which is essentially equivalent to Phase 1 of the Process Areas RI. To better inform the upcoming Step 2 of the Process Areas RI EPA will provide written review comments on the previous data summary reports.

The purpose of the Process Areas OU of this SOW is to conduct additional characterization of soils to supplement previous investigations and characterize other structural elements at and in the vicinity of the Process Areas where contamination may be present. Such activities include characterizing the nature and extent of contamination, assessing potential human health and ecological risk, and identifying portions of the Process Areas that may require characterization and remediation. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The distribution and general physical characteristics of soil material types (bedrock and alluvial soils);
- The history, design features, operating practices and period of operation;
- Physical and chemical characteristics of the materials including type, quantity and chemical composition of waste materials placed in the area;
- Potential migration and dispersal characteristics of the materials including hydraulic properties, sorption, biodegradability, hydrolysis rates and chemical transformations; and
- Potential biological effects of the waste on re-vegetation efforts and contaminant uptake potential.

Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding, dated March 28, 2002, shall be reviewed and considered in the preparation of the Work Plans and reports to be submitted under this task. The documents specific to this task to be considered include the *Process Areas Work Plan* dated December 15, 2003, the *Addendum to Process Areas Work Plan* dated May 5, 2004, the *Data Summary Report for Process Areas Soils Characterization* dated November 1, 2005 and the *Data Summary Report for Process Areas Groundwater Conditions* dated September 23, 2005. Additional documents containing pertinent information which should be consulted are the *Background Soils Work Plan* dated August 2, 2006, the *Final Radiological Monitoring Report October 2004 – April 2005, Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

Respondent shall provide an overview and historical information regarding the Process Areas and submit a *Process Areas Remedial Investigation Work Plan* in accordance with Appendix B of *EPA RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation, and the investigation schedule. The Work Plan shall identify the project team, describe investigation strategies and methods, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, and summarize all pertinent information necessary to characterize the vertical and lateral extent of potential contamination. A detailed description of activities necessary to conduct a baseline human health risk assessment for the Process Areas OU shall also be included in the *Process Areas Remedial Investigation Work Plan*.

Work Plan objectives include, but are not limited to, the additional characterization of Process

Areas soils (e.g., hydrocarbon-impacted soils) including material volumes, physical conditions, and potential migration pathways. Facilities such as buildings, shops and process components shall also be investigated. Data to be collected include hydraulic, geochemical and geotechnical properties, specifically vadose zone characteristics. Soil sampling may be supplemented by the installation and calibration of monitoring equipment to assess the hydraulic and chemical properties of sub-surface soil conditions. The *Process Areas Remedial Investigation Work Plan* will identify applicable PRGs or ambient levels as screening criteria for use in human health and ecological risk assessment activities. Such screening criteria will be used to determine the nature and extent of any contamination prior to the determination of appropriate Remedial Action Objectives ("RAOs") and preliminary identification of ARARs.

The Remedial Investigation shall address structures and other potential sources of contamination such as buildings, surface and sub-surface concrete structures including foundations, containments, leach vats, sumps, above-ground and underground tanks, underground utilities, above-ground utilities, piping, pumps, areas of discolored or odorous soil, and areas of reported spills.

Collect and analyze existing data – any information describing sources, migration pathways, human and environmental receptors, varieties and quantities of wastes disposed of, any sampling that examined physical and/or chemical characteristics, contaminant identification and respective concentrations, all precision and accuracy information, search records of disposal practices and operating procedures and manufacturing processes (such as historical photographs, topographic surveys, operational records, interviews), site-specific information on surface, subsurface, atmospheric, biotic migration pathways, geology, hydrogeology, hydrology, meteorology, ecology, need background soil, water, and air quality, demographic and land use information, common flora and fauna.

Define structures and other potential sources of contamination, such as buildings, surface and subsurface concrete structures including foundations, containments, leach vats, sumps, above and underground tanks, underground utilities, above ground utilities, piping, pumps, areas of discolored or odorous soil, areas of reported spills.

Characterize and assess the physical and chemical hazards associated with each of the structures on the Process Areas, including any Arimetco Facilities if available from work being conducted by EPA including; background conditions; a geologic assessment to evaluate influence of geology on release and movement of contaminants.

Analyze the fate and transport of each contaminant in each medium using data sufficient to define the extent, origin, direction, and rate of movement of contaminants including: vertical and horizontal extent of contamination, contaminant concentrations, velocity and direction of contaminant movement, and a description of the contaminant and soil chemical properties and interaction.

Assess the influence of soil on type and rate of contaminant movement to subsurface and ultimately to the water table. Determine soil characteristics – type, holding capacity, temperature, biological activity, engineering properties. Determine soil chemistry – solubility,

ion speciation, adsorption coefficients, leachability, cation exchange capacity, mineral partition coefficients, chemical and sorptive properties. Determine vadose zone characteristics – permeability, variability, porosity, moisture content, chemical characteristics, and extent of contamination.

Determine contamination in surface water and sediments, (data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminants), Surface water and sediment contamination including: the horizontal and vertical extent of contamination, direction of contaminant movement, velocity of contaminant movement, horizontal and vertical concentration contaminants, evaluation of factors affecting contaminant movement, description of the chemistry of the contaminant and surface water or sediment properties and interaction, and extrapolation of future contaminant movement and fate through modeling.

Determine contamination in and under structures, piping, disposal areas, ditches, roads and railways, spill areas, low-lying areas (This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminants) and estimate overall quantity of wastes and contaminants released over time.

Identify the extent of contaminant migration via surface and subsurface pathways, including the identification of migration pathways, as well as any changes in each contaminant's physical or chemical characteristics.

Describe the contaminant fate and transport from the surface and subsurface soils, including waste lines, into the unsaturated vadose zone via migration, leaching, or volatilization, and into the ambient air via fugitive dust or volatilization.

Identify any known or potential human or environmental receptors.

Identify contamination sources, including a description of the location and boundaries (areal extent and vertical depth) of each potential source of contamination, its physical characteristics, chemical constituents, and concentrations, based on sufficient sampling to the detection levels established in the DQOs identified in the QAPP.

Identify the information needed to assess risks to human health and the environment.

The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Process Areas Remedial Investigation Work Plan* shall describe how infrastructure units such as USTs, sewerage, acid and process fluids lines, will be investigated prior to and during demolition of any structures that may occur during the process of the investigation. The *Process Areas Remedial Investigation Work Plan* shall update the CSM for the Process Areas including COPCs and their sources, and links to potential receptors through release mechanisms, pathways, and exposure routes (i.e. contaminated soil, leachates into groundwater). The *Process Areas Remedial Investigation Work Plan* shall also describe methods for identifying COPCs, types of

contamination and affected media within the Process Areas.

Field support activities include, but are not be limited to, obtaining access to private and public properties where investigative activities are to be conducted, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field activities, analytical results from samples will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP. The description of all field activities and a summary of analytical results will be presented in a *Process Areas Remedial Investigation Report*.

As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 10.0 EVAPORATION PONDS AND SULFIDE TAILINGS OPERABLE UNIT

The purpose of this OU investigation is to characterize the materials and other structural units within the limits of the Evaporation Ponds and Sulfide Tailings OU (Figure 1-1); to characterize the pond solids, liners (where existing) and underlying native soils within the limits of the Evaporation Ponds (Finger, Lined and Unlined Evaporation Ponds in Figure 1-1), the Pumpback Collection Ponds and the Weed Heights Sewage Ponds; to assess the nature and extent of contaminated materials; assess potential human health and ecological risks; and identify portions of the Evaporation Ponds and Sulfide Tailings OU that may require remediation. The Evaporation Ponds have been identified as a high-priority area for the RI/FS process given the geochemical character of the process solutions that were evaporated in these ponds. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The distribution and general physical characteristics of tailings materials, pond solids, pond liners (where existing), and underlying native soils beneath both the ponds and the tailings materials;
- The history, design features, operating practices and period of operation;
- Physical and chemical characteristics of the pond materials (i.e., pond solids, pond liners, and underlying native soil) and the tailings including type, quantity and chemical composition;
- Potential migration and dispersal characteristics of the pond materials and tailings including hydraulic properties, sorption, biodegradability, hydrolysis rates and chemical transformations; and
- Potential biological effects of the pond materials and tailings on re-vegetation efforts and contaminant uptake potential.

Because the Evaporation Ponds and Sulfide Tailings OU is adjacent to a number of other OUs on the Site (Process Areas, Oxide Tailings and Wabuska Drain OUs), some elements of these OUs may be common to one another, and should be reflected in the individual Work Plans. Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding, dated March 28, 2002, should be reviewed and used in the preparation of the Work Plans and reports to be submitted for this OU. The document specific to this task should include the *Draft Final Tailings Areas and Evaporation Ponds Work Plan* dated February 14, 2003. Additional documents containing pertinent information which should be consulted are the *Background Soils Work Plan* dated August 2, 2006, the *Final Radiological Monitoring Report October 2004 – April 2005*, *Yerington Mine Site Investigation Operations, Lyon County, Nevada*, dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

In addition, the RI/FS process for the Evaporation Ponds and Sulfide Tailings OU shall include any characterization data or interim remedial activity implemented under a Work Plan requested by EPA to Respondent in a letter dated August 4, 2006 regarding surface fluids at the site and potential exposure to eco-receptors.

Respondent shall provide an overview of historical information on the Evaporation Ponds and Sulfide Tailings and submit an *Evaporation Ponds and Sulfide Tailings Remedial Investigation Work Plan* in accordance with Appendix B of *EPA RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation. The Work Plan will identify the project team, describe investigation strategies and methodologies, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, the investigation schedule, and summarize all pertinent information necessary to characterize the vertical and lateral extent of potential contamination. A detailed description of activities necessary to conduct a baseline human health risk assessment for the Evaporation Ponds and Sulfide Tailings OU shall also be included in the *Evaporation Ponds and Sulfide Tailings Remedial Investigation Work Plan*.

Work Plan objectives include, but are not limited to, the characterization and description of the pond materials (described above) and the sulfide tailings materials including material volumes, physical conditions, and potential migration pathways. Data to be collected include hydraulic, geochemical and geotechnical properties, specifically vadose zone characteristics.

Soil assessment by evaluating influence on type and rate of contaminant movement to subsurface and ultimately to the water table; soil characteristics – type, holding capacity, temperature, biological activity, engineering properties; soil chemistry – solubility, ion speciation, adsorption coefficients, leachability, cation exchange capacity, mineral partition coefficients, chemical and sorptive properties.

Determine vadose zone characteristics – permeability, variability, porosity, moisture content, chemical characteristics, and extent of contamination.

Assess contamination through soil sampling - soil and rock characterization above water table shall include but not be limited to; SCS soil classification, including soil types in adjacent undisturbed lands; surface soil distribution; hydraulic conductivity (saturated and unsaturated);

bulk density; porosity; soil pH; particle size distribution; moisture content, specific capacity, infiltration rate; Soil stratification effect on unsaturated flow; water sampling characterize and describe contents, material volume, physical conditions, potential pathways of contaminant movement.

Discrete samples of pond materials shall be collected on the surface and at depth to represent the range of potential material types, and the physical and chemical properties of the pond materials.

The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Evaporation Ponds and Sulfide Tailings Remedial Investigation Work Plan* will identify applicable PRGs or ambient levels as screening criteria for use in human health and ecological risk assessment activities. Such screening criteria will be used to determine the nature and extent of any contamination prior to the determination of appropriate RAOs and preliminary identification of ARARs.

Discrete samples of tailings shall be collected on the surface and at depth to represent the range of potential material types and periods of deposition, and the physical and chemical properties of the tailings. Activities may include some, or all, of the following: development and implementation of an ecological field survey, a surface sampling grid and the identification of borehole locations for the collection of pond materials and tailings samples at depth. Sampling of pond materials and tailings may be supplemented by the installation and calibration of monitoring equipment to assess the hydraulic and chemical properties of the sub-surface portions of the Evaporation Ponds and Sulfide Tailings OU.

Field support activities include, but are not be limited to, obtaining access to private and public properties where investigative activities are to be conducted, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field activities, analytical results from samples of tailings materials will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP. The description of all field activities and a summary of analytical results will be presented in an *Evaporation Ponds and Sulfide Tailings Remedial Investigation Report*.

As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 11.0 WASTE ROCK AREAS OPERABLE UNIT

The purpose of this OU is to characterize the overburden materials, soils, vadose zone and other structural units within the limits of the Waste Rock Areas (both North and South) (Figure 1-1) to assess the nature and extent of contamination and potential human health and ecological risks,

and identify portions of the Waste Rock Areas that may require remediation. Inactive Arimetco Facilities within the boundaries of this OU will be evaluated separately. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The distribution and general physical characteristics of waste rock material types (bedrock and alluvial soils);
- The history, design features, operating practices and period of operation;
- Physical and chemical characteristics of the materials including type, quantity and chemical composition of waste materials placed in the area;
- Potential migration and dispersal characteristics of the materials including hydraulic and hydrogeologic properties, sorption, biodegradability, hydrolysis rates and chemical transformations; and
- Potential biological effects of the waste on re-vegetation efforts and contaminant uptake potential.

Because portions of the Waste Rock Areas and Pit Lake OUs are adjacent, some elements of the two OUs may be common to one another, and should be reflected in the individual Work Plans. Pertinent Work Plans and reports that have been prepared under the previous Memorandum of Understanding dated March 28, 2002, should be reviewed and used in the preparation of the Waste Rock Areas Work Plan and reports to be submitted under this OU. The documents specific to this task should include the *Final Draft Waste Rock Areas Work Plan* dated February 14, 2003 and the *Draft Final Cover Materials Work Plan* dated December 5, 2002. Additional documents containing pertinent information which should be consulted are the *Background Soils Work Plan* dated August 2, 2006 and the *Final Radiological Monitoring Report October 2004 – April 2005, Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

Respondent shall provide an overview and historical information regarding the Waste Rock Areas and submit a *Waste Rock Areas Remedial Investigation Work Plan* in accordance with Appendix B of *EPA RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation, and the investigation schedule. The Work Plan will identify the project team, describe investigation strategies and methodologies, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, and summarize all pertinent information necessary to characterize the vertical and lateral extent of potential contamination. A detailed description of activities necessary to conduct a baseline human health risk assessment for the Waste Rock Areas OU shall also be included in the *Waste Rock Areas Remedial Investigation Work Plan*.

Work Plan objectives include, but are not limited to, the characterization and description of waste rock materials including material volumes, physical conditions, and potential migration pathways. Data to be collected include hydraulic, geochemical and geotechnical properties,

including vadose zone characteristics.

Conduct a geologic assessment by evaluating influence of geology on release and movement of contaminants by evaluating regional geology in published reports, state geologic maps, USGS topographic maps, and previous site investigations.

Discrete samples of material types from the Waste Rock Area shall be collected on the surface and down to total depth within the piles to represent the range of material types, deposition periods, and physical and chemical properties within this OU.

Perform a soil assessment and evaluate influence on type and rate of contaminant movement to subsurface and ultimately to the water table

Characterize soils and rock materials above the water table including but not limited to; SCS soil classification, including soil types in adjacent undisturbed lands; surface soil distribution; hydraulic conductivity (saturated and unsaturated); bulk density; porosity; soil pH; particle size distribution; moisture content, specific capacity, infiltration rate; Soil stratification effect on unsaturated flow; soil characteristics such as type, holding capacity, temperature, biological activity, engineering properties; soil chemistry – solubility, ion speciation, adsorption coefficients, leachability, cation exchange capacity, mineral partition coefficients, chemical and sorptive properties.

Determine vadose zone characteristics – permeability, variability, porosity, moisture content, chemical characteristics, and extent of contamination.

The assessment should conform to proper radiation investigation protocols outlined in the *Multi-Agency Radiation Survey and Site Investigation Manual* ("MARSSIM"), EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Waste Rock Areas Remedial Investigation Work Plan* will identify applicable PRGs or ambient levels as screening criteria for use in human health and ecological risk assessment activities. Such screening criteria will be used to determine the nature and extent of any contamination prior to the determination of appropriate RAOs and preliminary identification of ARARs.

Activities may include some, or all, of the following: development and implementation of an ecological field survey, a surface sampling grid and the identification of borehole locations for the collection of waste rock samples at depth. Sampling of waste rock materials may be supplemented by the installation and calibration of monitoring equipment to assess the hydraulic and chemical properties of the sub-surface waste rock materials.

Field support activities include, but are not be limited to, obtaining access to private and public properties where investigative activities are to be conducted, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field activities, analytical results from waste rock samples will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated

QAPP and the DMP. The description of all field activities and a summary of analytical results will be presented in a *Waste Rock Areas Remedial Investigation Report*. As described in Section 1.4 of this SOW, the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 12.0 OXIDE TAILINGS OPERABLE UNIT

The purpose of the remedial investigation of this OU is to characterize the tailings materials and other structural units within the limits of the Oxide Tailings (Figure 1-1) to assess the nature and extent of the materials, potential human health and ecological risks, and portions of the Oxide Tailings that may require remediation. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The distribution and general physical characteristics of tailings materials;
- The history, design features, operating practices and period of operation;
- Physical and chemical characteristics of the tailings including type, quantity and chemical composition;
- Potential migration and dispersal characteristics of the materials including hydraulic properties, sorption, biodegradability, hydrolysis rates and chemical transformations; and
- Potential biological effects of the tailings on re-vegetation efforts and contaminant uptake potential.

Because the Oxide Tailings is adjacent to a number of other OUs on the Site (Process Areas and Evaporation Ponds and Sulfide Tailings OUs), some elements of these OUs may be common to one another, and should be reflected in the individual Work Plans. Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding, dated March 28, 2002, should be reviewed and used in the preparation of the Work Plans and reports to be submitted for this OU. The document specific to this task is the *Draft Final Tailings Areas and Evaporation Ponds Work Plan* dated February 14, 2003. Additional documents containing pertinent information which should be consulted are the *Background Soils Work Plan* dated August 2, 2006 and the *Final Radiological Monitoring Report October 2004 – April 2005, Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005.

Respondent shall provide an overview of historical information on the Oxide Tailings and submit an *Oxide Tailings Remedial Investigation Work Plan* in accordance with Appendix B of EPA *RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation. The Work Plan will identify the project team, describe investigation strategies and methodologies, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, the investigation schedule, and summarize all pertinent information necessary to

characterize the vertical and lateral extent of potential contamination. A detailed description of activities necessary to conduct a baseline human health risk assessment for the Oxide Tailings OU shall also be included in the *Oxide Tailings Remedial Investigation Work Plan*.

Work Plan objectives include, but are not limited to, the characterization and description of the tailings materials including material volumes, physical conditions, and potential migration pathways. Data to be collected include hydraulic, geochemical and geotechnical properties, specifically vadose zone characteristics.

Geologic assessment by evaluating influence of geology on release and movement of contaminants by evaluating regional geology in published reports, state geologic maps, USGS topographic maps, and previous site investigations.

Perform a soil assessment and evaluate influence on type and rate of contaminant movement to subsurface and ultimately to the water table.

Determine soil and rock characterization above water table including, but not limited to; SCS soil classification, including soil types in adjacent undisturbed lands; surface soil distribution; hydraulic conductivity (saturated and unsaturated); bulk density; porosity; soil pH; particle size distribution; moisture content; specific capacity; infiltration rate; soil stratification effect on unsaturated flow; soil characteristics such as type, holding capacity, temperature, biological activity, engineering properties; soil chemistry – solubility, ion speciation, adsorption coefficients, leachability, cation exchange capacity, mineral partition coefficients, chemical and sorptive properties.

Determine vadose zone characteristics – permeability, variability, porosity, moisture content, chemical characteristics, and extent of contamination.

Discrete samples will be taken to total depth of the piles with samples from each level representing different time periods of deposition.

The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Oxide Tailings Remedial Investigation Work Plan* will identify applicable PRGs or ambient levels as screening criteria for use in human health and ecological risk assessment activities. Such screening criteria will be used to determine the nature and extent of any contamination prior to the determination of appropriate RAOs and preliminary identification of ARARs.

Discrete samples of tailings shall be collected on the surface and at depth to represent the range of potential material types, and the physical and chemical properties of the tailings. Activities may include some, or all, of the following: development and implementation of an ecological field survey, a surface sampling grid and the identification of borehole locations for the collection of tailings samples at depth. Sampling of tailings may be supplemented by the installation and calibration of monitoring equipment to assess the hydraulic and chemical

properties of the sub-surface portions of the Oxide Tailings OU.

Field support activities include, but are not be limited to, obtaining access to private and public properties where investigative activities are to be conducted, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field activities, analytical results from samples of tailings materials will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP. The description of all field activities and a summary of analytical results will be presented in an *Oxide Tailings Remedial Investigation Report*.

As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 13.0 WABUSKA DRAIN OPERABLE UNIT

The purpose of this OU is to characterize the native soils, potential deposits of sediments within the Wabuska Drain OU (Figure 1-1) to assess potential human health and ecological risks and portions of the Wabuska Drain that may require remediation. The collection of an adequate number of samples to satisfy the DQOs for this OU shall include the following and, as applicable, the requirements presented in Sections 1.3.4 and 1.3.5 of this SOW:

- The distribution and general physical characteristics of native soils and deposited materials within the Drain alignment, including the original alignment;
- The history, design features, operating practices and period of operation;
- Physical and chemical characteristics of the native soils and deposited materials; and
- Potential migration and dispersal characteristics of the materials including hydraulic properties, sorption, biodegradability, hydrolysis rates and chemical transformations.

Because the Wabuska Drain is adjacent to another on-Site OU (Evaporation Ponds and Sulfide Tailings OU), some elements of these OUs may be common to one another, and should be reflected in the individual Work Plans. Pertinent Work Plans and reports that have been prepared under the Memorandum of Understanding, dated March 28, 2002, should be reviewed and used in the preparation of the Work Plan and reports to be submitted for this OU. The document specific to this OU should include the *Draft Final Wabuska Drain Work Plan* dated April 7, 2003. Additional documents containing pertinent information which should be consulted are the *Background Soils Work Plan* dated August 2, 2006, the *Final Radiological Monitoring Report October 2004 – April 2005*, *Yerington Mine Site Investigation Operations, Lyon County, Nevada* dated October 10, 2005 and the *Radiological Data Compilation Yerington Mine Site* dated December 15, 2005. In addition, the associated Site-wide groundwater investigation including off-Site areas will have a direct affect on the Wabuska Drain OU.

Respondent shall provide an overview of historical information on the Wabuska Drain and submit a *Wabuska Drain Remedial Investigation Work Plan* in accordance with Appendix B of *EPA RI/FS Guidance* that describes the DQOs and tasks associated with performing the investigation. The Work Plan will identify the project team, describe investigation strategies and methodologies, provide a project management plan, reference the DMP described in Section 4.0 of this SOW, the investigation schedule, and summarize all pertinent information necessary to characterize the vertical and lateral extent of any potential contamination. A detailed description of activities necessary to conduct a baseline human health risk assessment for the Wabuska Drain OU shall also be included in the *Wabuska Drain Remedial Investigation Work Plan*.

Work Plan objectives include, but are not limited to, the characterization and description of the Wabuska Drain soils and any deposited materials including material volumes, physical conditions, and potential migration pathways. Data to be collected include hydraulic, geochemical and vadose zone characteristics. Respondent shall assess the nature and extent of any potential contamination in the Wabuska Drain by sampling soils and any accumulated sediments within and adjacent to the Drain. In addition, quarterly water sampling shall be conducted for at least one year to assess any seasonal variations in water quality including field parameters, water temperature, pH, dissolved oxygen ("DO"), conductivity, and concentrations of total and dissolved metals. Flow measurements will be obtained during quarterly monitoring at locations with defined channel dimensions. Respondent shall assess possible movement of contaminants to down-gradient receptors via water flow and/or sediment transport and, if required, develop fate-and-transport model of down-gradient contaminant transport. Respondent shall also provide information on drainage patterns such as overland flow, topography, channel flow pattern, tributary relationships, soil erosion, sediment transport and deposition associated with agricultural operations in the vicinity of the Wabuska Drain.

Assess nature and extent of soil contamination by evaluating influence on type and rate of contaminant movement to subsurface and ultimately to the water table; consider soil characteristics such as type, holding capacity, temperature, biological activity, engineering properties; consider soil chemistry including solubility, ion speciation, adsorption coefficients, leachability, cation exchange capacity, mineral partition coefficients, chemical and sorptive properties.

Assess vadose zone characteristics in particular permeability, variability, porosity, moisture content, chemical characteristics, extent of contamination

The assessment should conform to proper radiation investigation protocols outlined in the "Multi-Agency Radiation Survey and Site Investigation Manual" ("MARSSIM") EPA402-R-97-016/NUREG-1575, following radiological requirements as listed in Task 1.3.4 of the SOW.

The *Wabuska Drain Remedial Investigation Work Plan* will identify applicable PRGs or ambient levels as screening criteria for use in human health and ecological risk assessment activities. Such screening criteria will be used to determine the nature and extent of any contamination prior to the determination of appropriate RAOs and preliminary identification of ARARs. Discrete samples of Wabuska Drain soils and deposited materials shall be collected on the surface and at depth to represent the range of potential material types, and the physical and

chemical properties of these materials. Activities may include some, or all, of the following: development and implementation of an ecological field survey and the identification of borehole locations for the collection of samples at depth.

Field support activities include, but are not be limited to, obtaining access to private and public properties where investigative activities are to be conducted, scheduling activities, and procurement of field equipment, office space, laboratory services and contractors. Upon completion of all field activities, analytical results from samples of tailings materials will be entered into the project database after appropriate QA/QC procedures are performed, pursuant to the updated QAPP and the DMP.

The description of all field activities and a summary of analytical results will be presented in a *Wabuska Drain Remedial Investigation Report*. As described in Section 1.4 of this SOW, completion of the *Remedial Investigation Report* will be accompanied by the *Baseline Human Health Risk Assessment Report*. The additional tasks listed in Section 1.4 would then be implemented according to the general schedule presented in Section 1.5 of this SOW.

SECTION 14.0 SITE-WIDE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

A screening level ecological risk assessment ("SLERA") will be conducted to characterize ecological risks associated with each of the OUs described in this SOW (a separate SLERA will be conducted by EPA for the Arimetco Facilities). The purpose of the SLERAs will be to determine whether ecological threats at an OU are negligible, or whether a more detailed baseline ecological risk assessment ("BERA") should be conducted to facilitate site-management and remediation decisions. For each OU, the SLERA will determine if site-related contaminants pose a concern for potential risk to the environment in the absence of any remedial action.

Respondent shall address the elements of the ecological risk assessment paradigm (problem formulation, analysis of exposure, analysis of effects, risk characterization, science-management decision points). Respondents shall prepare a SLERA in accordance with EPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final*, EPA 540-R-97-006 (EPA OSWER, 1997). Also to be included is U.S. Department of Energy's (DOE's) *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, DOE Technical Standard, Project Number ENVR-0011 (Washington, DC, June 2002).

The SLERA shall be performed in two steps: 1) problem formulation and effects assessment; and 2) exposure assessment and risk characterization. For the screening-level problem formulation and ecological effects evaluation, preliminary site observations and data shall be used to:

- Characterize the environmental setting and contaminants at the site – The SLERA shall review available information on the hazardous substances present at the site and identify Site-related COPCs.
- Assess contaminant fate and transport.

- Identify complete exposure pathways and potential receptors of concern.
- Assess eco-toxicity of chemicals of interest and identify appropriate screening level values or toxicity reference values - COPCs should be selected based on their intrinsic toxicological properties. Conservative literature-based eco-toxicological benchmarks will be identified to address the predicted magnitude of adverse environmental effects associated with chemical exposures.
- Select assessment and measure endpoints for receptors that may be at risk. Respondent shall select representative COPCs, indicator species (species that are especially sensitive to environmental contaminants) and end points on which to focus the assessment.
- Develop a conceptual model with working hypotheses or questions that can be addressed by the screening level exposure and risk characterization. Critical exposure pathways (e.g., surface soil) shall be identified and analyzed. The proximity of contaminants to exposure pathways and their potential to migrate into critical exposure pathways shall be assessed.

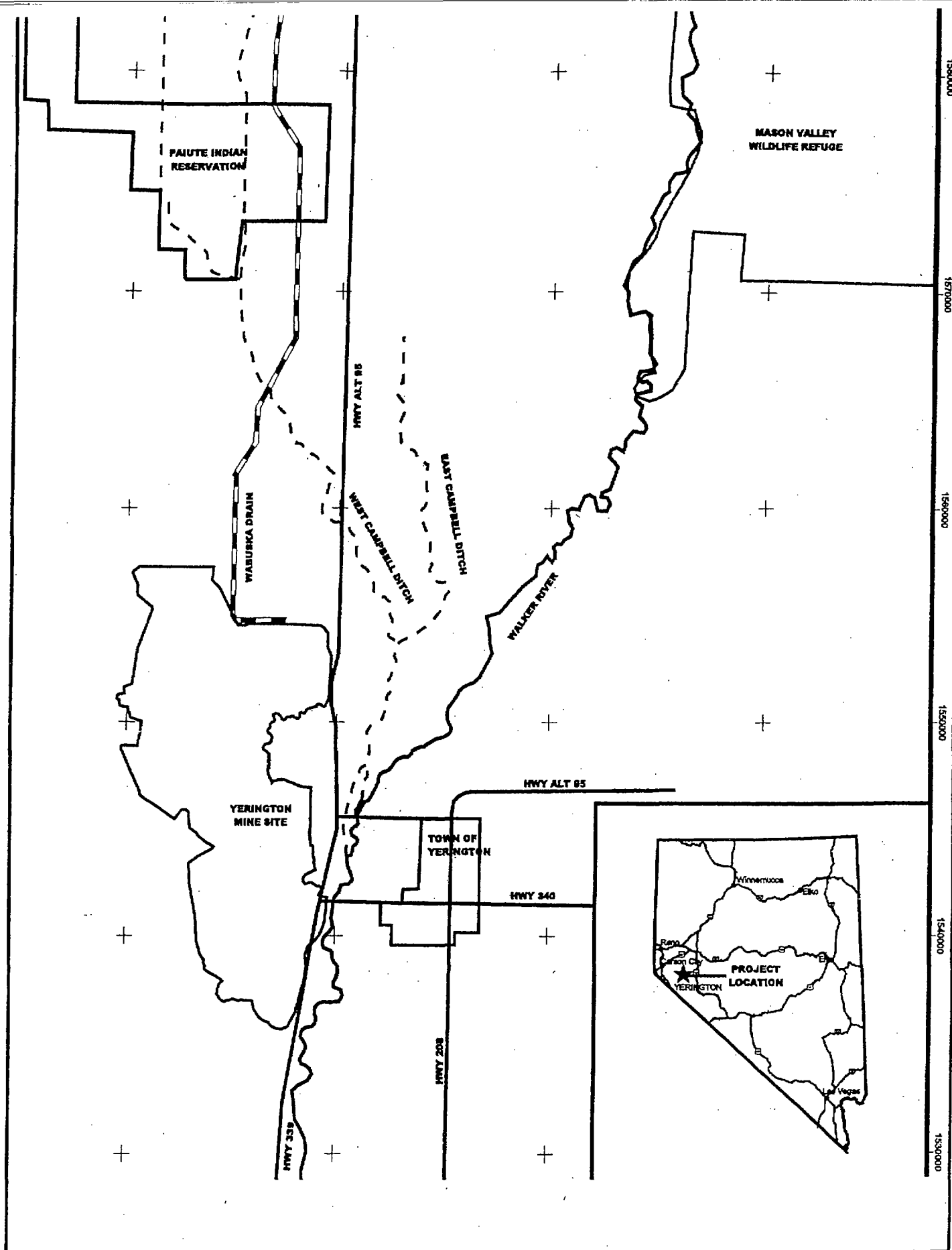
The screening level exposure and risk characterization will:

- Select appropriate exposure parameters for receptors of concern based on site use, dietary composition, ingestion rates, body weight, and life history stage – Exposure Assessment. The exposure assessment will identify the magnitude of actual or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed.
- Estimate exposure expressed as a media-specific concentration or a chemical dose – The exposure assessment will be based on the maximum levels of Site contamination or the levels predicted through environmental fate and transport modeling, as appropriate for the selected potential receptors.
- Compare estimated exposure values to appropriate screening level values or toxicity reference values - Through these comparisons, the Risk Characterization shall determine whether concentrations of contaminants at or near the site are affecting or could potentially affect the environment.

The results of the SLERAs shall be used to eliminate any contaminants and exposure pathways that pose negligible risks and to identify any exposure pathways and preliminary contaminants of concern that exceed de minimis levels for inclusion in a baseline ecological risk assessment if needed. EPA and Respondent shall subsequently determine if a Site-wide ecological risk assessment is required pending the results of the OU-specific SLERAs.

SECTION 15.0 INTEGRATED SOW SCHEDULE

Table 2, presented in Section 1.5 of this SOW, summarizes a potential implementation schedule for the RI/FS activities described in this SOW. Initially, the updated QAPP, HASP and CSM would be submitted for review and approval by EPA within first 90 days following the effective date of the AOC. Also, the DMP will be submitted during this period. EPA approval of these documents shall be required prior to the submittal of the draft Site-Wide Groundwater Monitoring Plan and subsequent Work Plans. Respondent and EPA shall facilitate the approval process by conference calls and meetings, as necessary.



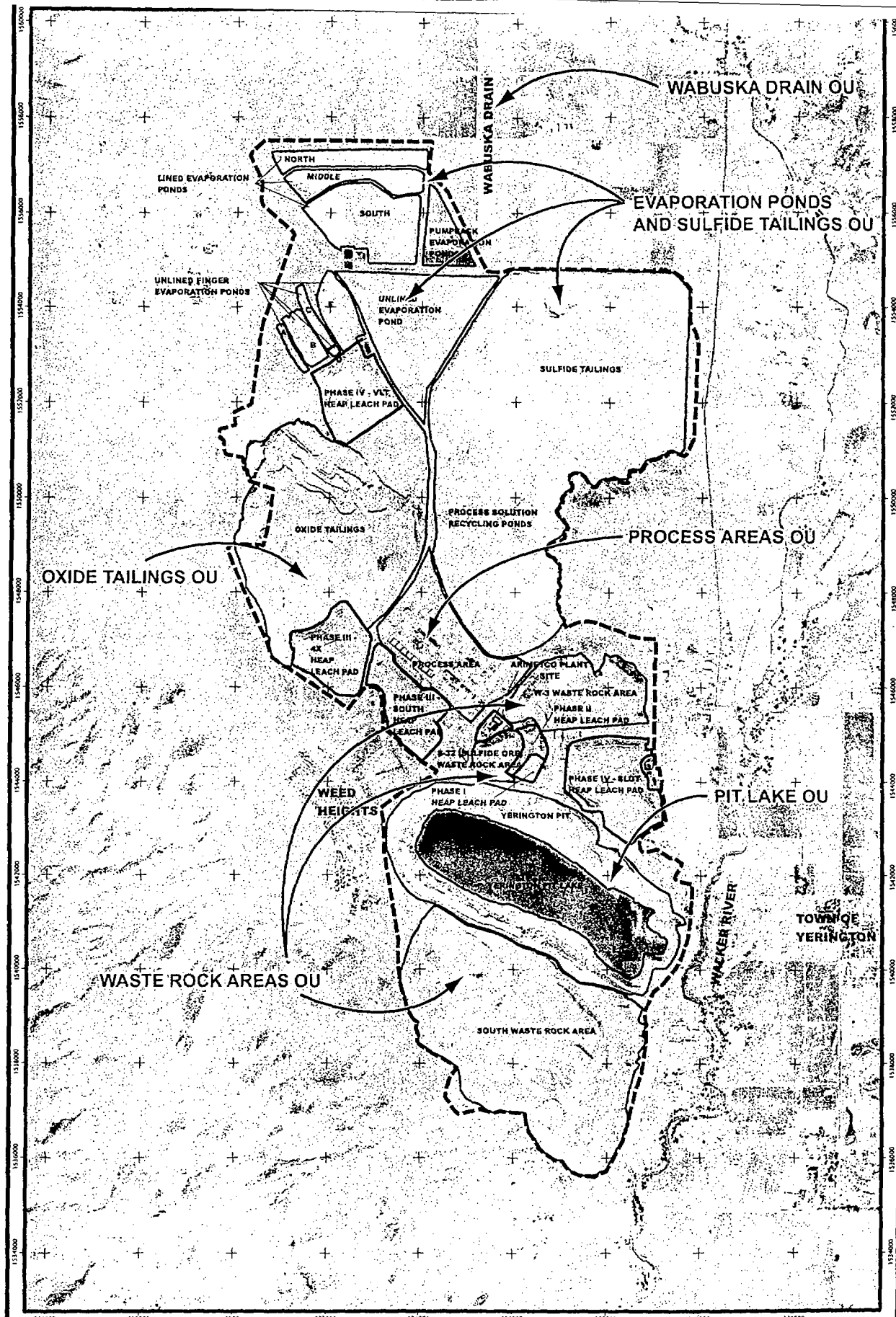
**BROWN AND
CALDWELL**

DATE: SEPTEMBER 2006
Atlantic Richfield Company
PROJECT NUMBER: 129691

0 3600 7200
SCALE IN FEET



FIGURE 1
PROJECT LOCATION



<p>NOTES: 1) PROJECTION: NEVADA STATE PLANE, WEST ZONE 1427 NORTH AMERICAN DATUM (NAD 83) 2) IMAGE PHOTO TAKEN: OCTOBER 1991</p> <p>MODIFIED FROM: BROWN AND CALDWELL</p>	<p>EXPLANATION</p> <p>--- MINE SITE BOUNDARY [] MINE UNIT</p> <p>SCALE: 1:50,000</p> <p>0 1000 2000 3000 4000 5000 6000 7000</p>	<p>FIGURE 1 OPERABLE UNITS ANACONDA COPPER YERINGTON MINE SITE U.S. EPA REGION 9</p> <p>CH2MHILL</p>
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